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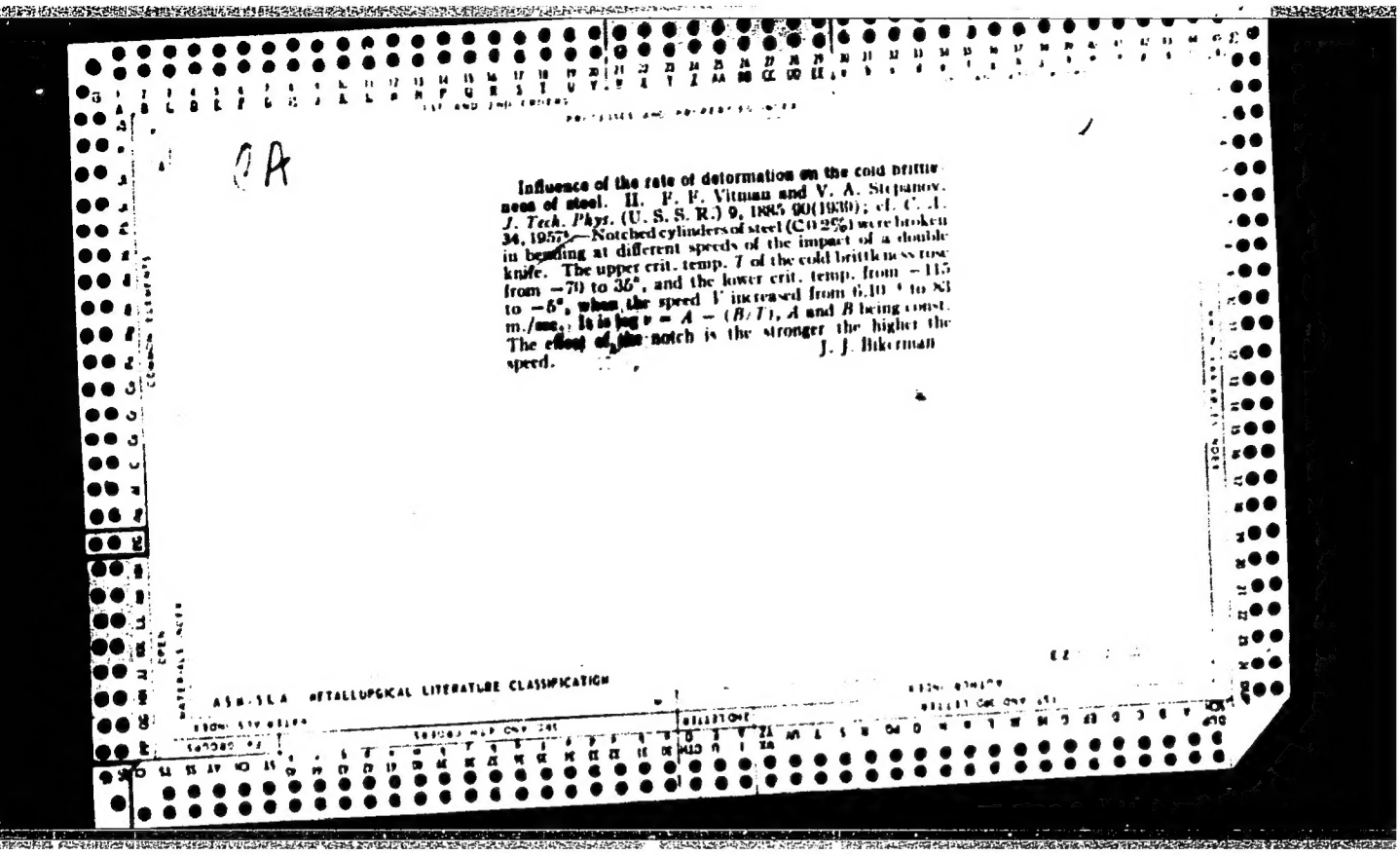

9A

Influence of the rate of deformation on the cold brittleness of steel. II. F. F. Vitman and V. A. Stepanov. *J. Tech. Phys.* (U. S. S. R.) 9, 1885-90(1939); cf. C. A. 34, 1957⁸.—Notched cylinders of steel (C 0.25%) were broken in bending at different speeds of the impact of a double knife. The upper crit. temp. T of the cold brittleness rose from −70 to 35°, and the lower crit. temp. from −115 to −6°, when the speed V increased from 6.10 ⁴ to 83 m./sec.; it is $\log v = A - (B/T)$, A and B being const. The effect of the notch is the stronger the higher the speed. J. J. Bikerman

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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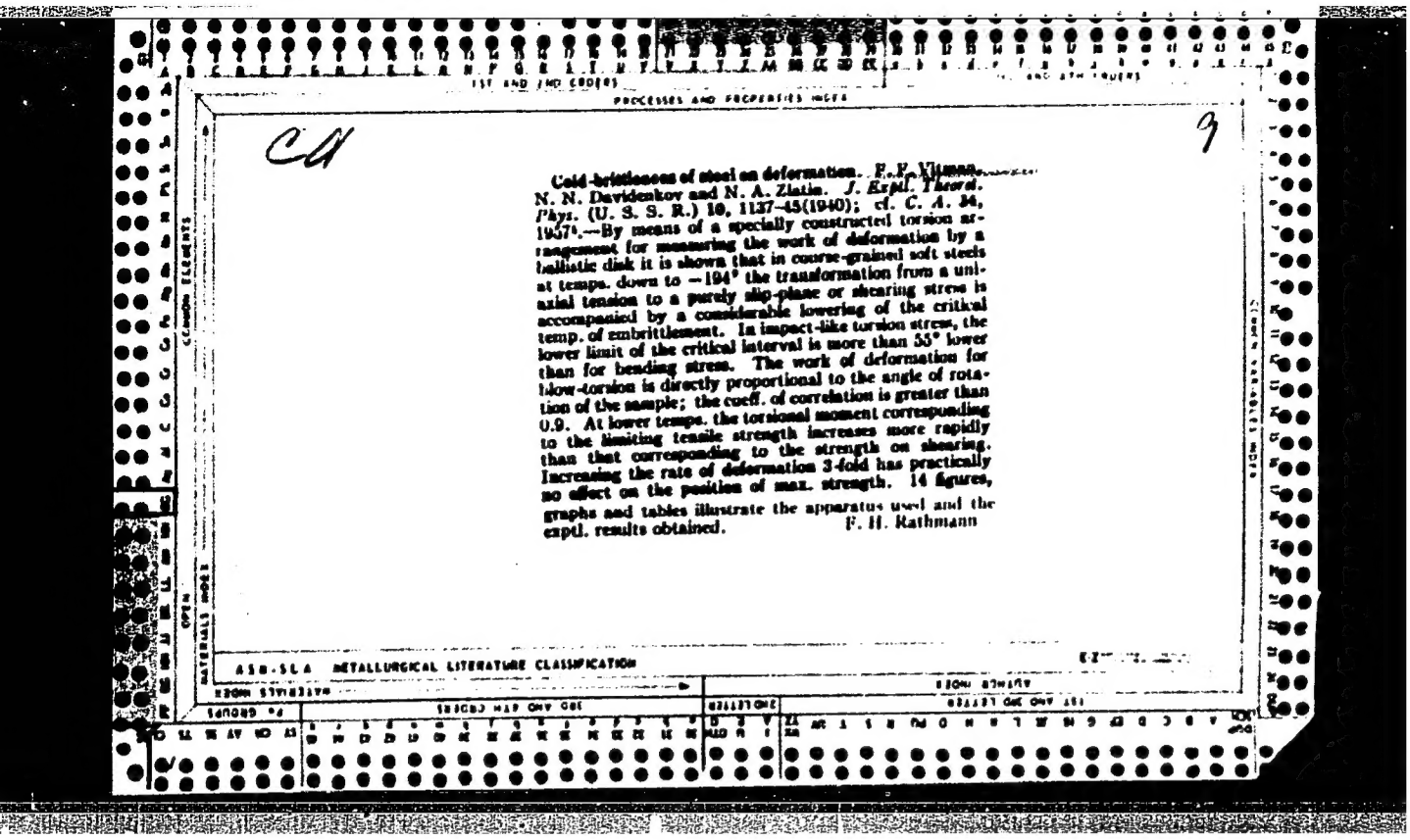

Cold-brittleness of steel on deformation. F. F. Vitman, N. N. Davidenkov and N. A. Zlatin. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 10, 1137–45(1940); cf. *C. A.* 34, 1957⁶.—By means of a specially constructed torsion arrangement for measuring the work of deformation by a ballistic disk it is shown that in course-grained soft steels at temps. down to −194° the transformation from a uniaxial tension to a purely slip-plane or shearing stress is accompanied by a considerable lowering of the critical temp. of embrittlement. In impact-like torsion stress, the lower limit of the critical interval is more than 55° lower than for bending stress. The work of deformation for slow-torsion is directly proportional to the angle of rotation of the sample; the coeff. of correlation is greater than 0.9. At lower temps. the torsional moment corresponding to the limiting tensile strength increases more rapidly than that corresponding to the strength on shearing. Increasing the rate of deformation 3-fold has practically no effect on the position of max. strength. 14 figures, graphs and tables illustrate the apparatus used and the exptl. results obtained. F. H. Rathmann

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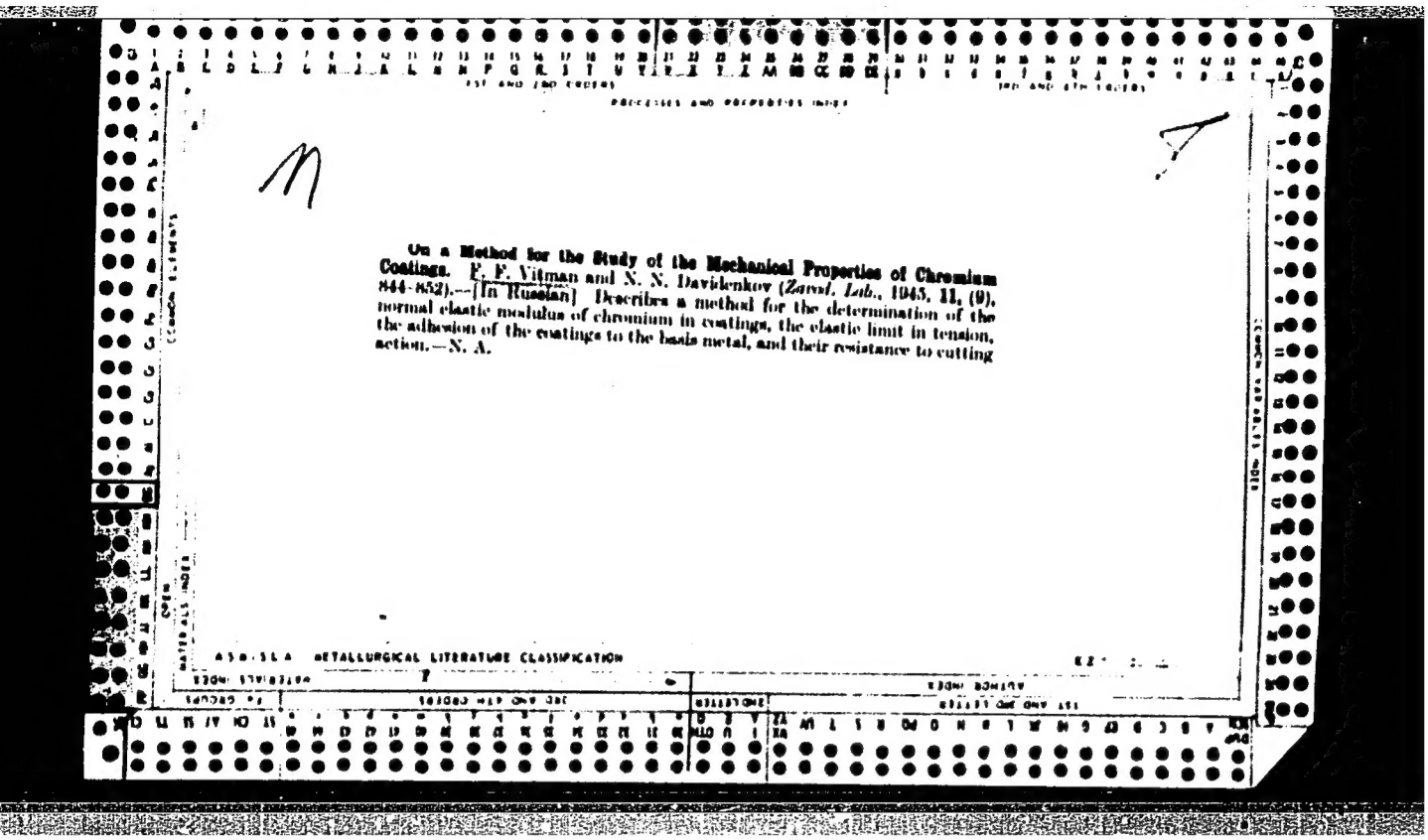

On a Method for the Study of the Mechanical Properties of Chromium Coatings. F. F. Vitman and N. N. Davidenkov (*Zavod. Lab.*, 1945, **11**, (9), 844-852).—[In Russian] Describes a method for the determination of the normal elastic modulus of chromium in coatings, the elastic limit in tension, the adhesion of the coatings to the basis metal, and their resistance to cutting action.—N. A.

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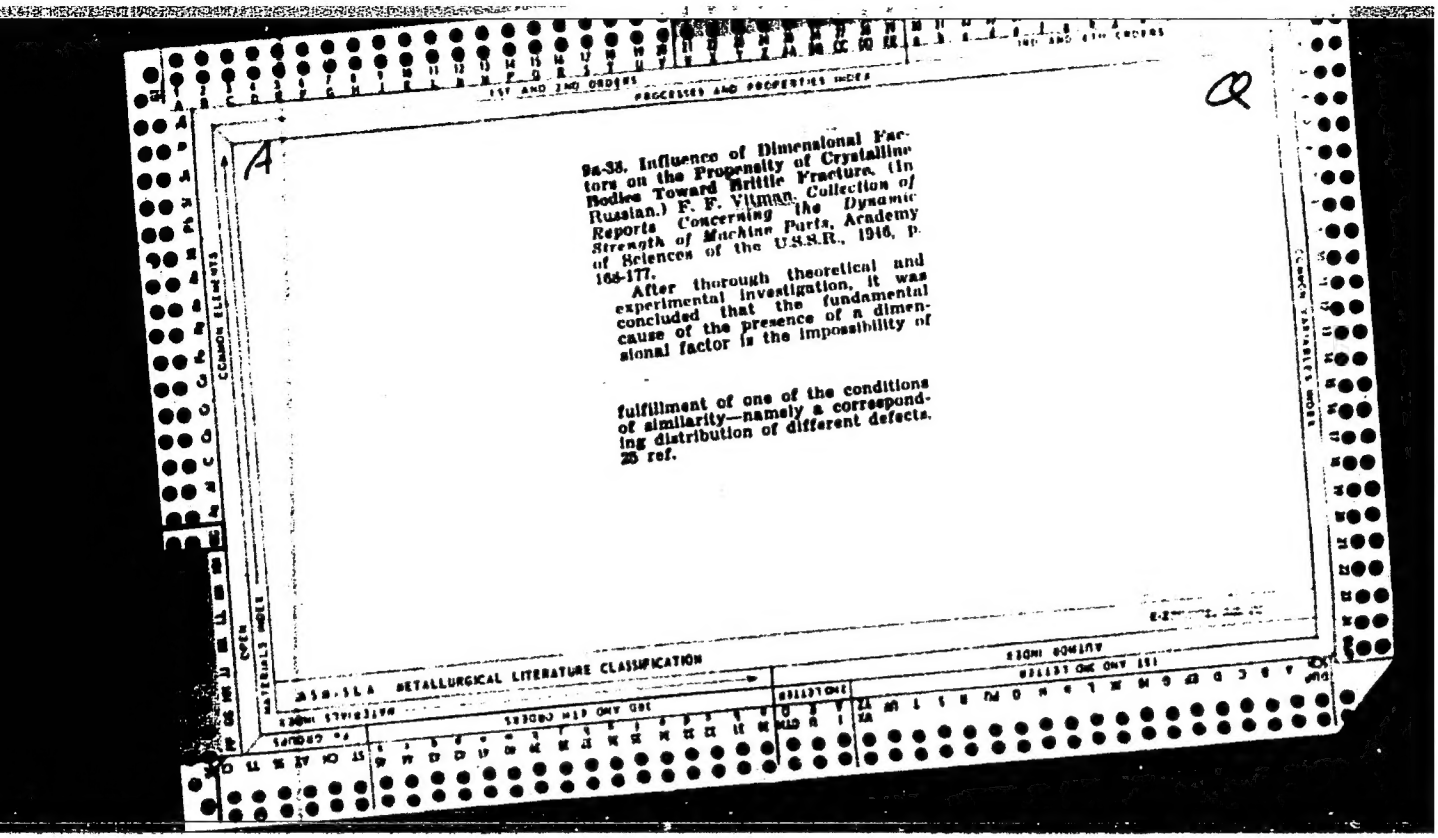

9a-38. Influence of Dimensional Factors on the Propensity of Crystalline Bodies Toward Brittle Fracture. (In Russian.) F. F. Vitman. *Collection of Reports Concerning the Dynamic Strength of Machine Parts*, Academy of Sciences of the U.S.S.R., 1946, p. 168-177.

After thorough theoretical and experimental investigation, it was concluded that the fundamental cause of the presence of a dimensional factor is the impossibility of fulfillment of one of the conditions of similarity—namely a corresponding distribution of different defects. 25 ref.

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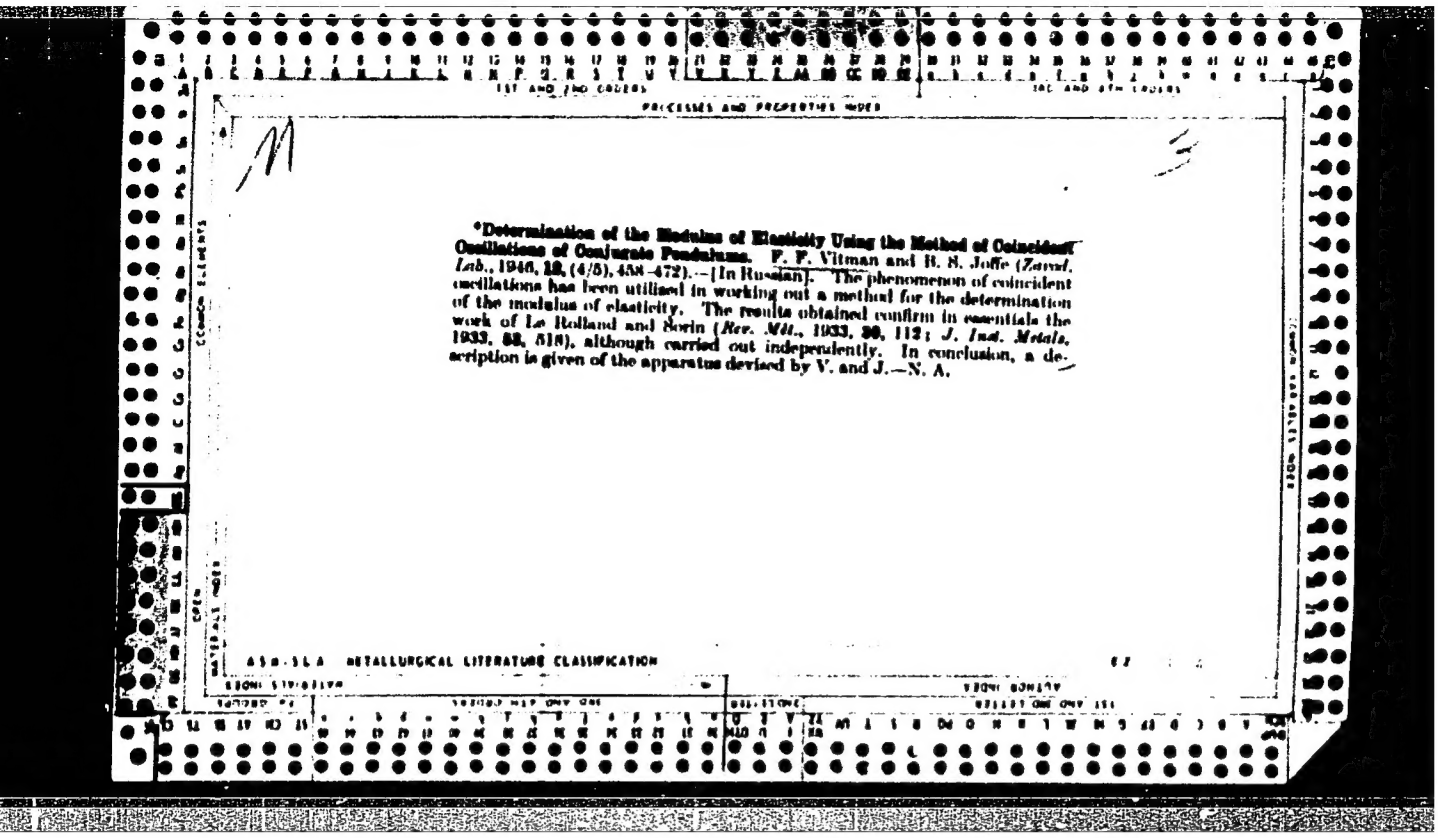

PROCESSES AND PROPERTIES INDEX

M

3

***Determination of the Modulus of Elasticity Using the Method of Coincident Oscillations of Conjugate Pendulums.** F. F. Vitman and B. N. Joffe (*Zavod. Lab.*, 1946, **12**, (4/5), 458–472).—[In Russian]. The phenomenon of coincident oscillations has been utilised in working out a method for the determination of the modulus of elasticity. The results obtained confirm in essentials the work of Le Rolland and Sorin (*Rev. Mét.*, 1933, **30**, 112; *J. Inst. Metals*, 1933, **53**, 518), although carried out independently. In conclusion, a description is given of the apparatus devised by V. and J.—N. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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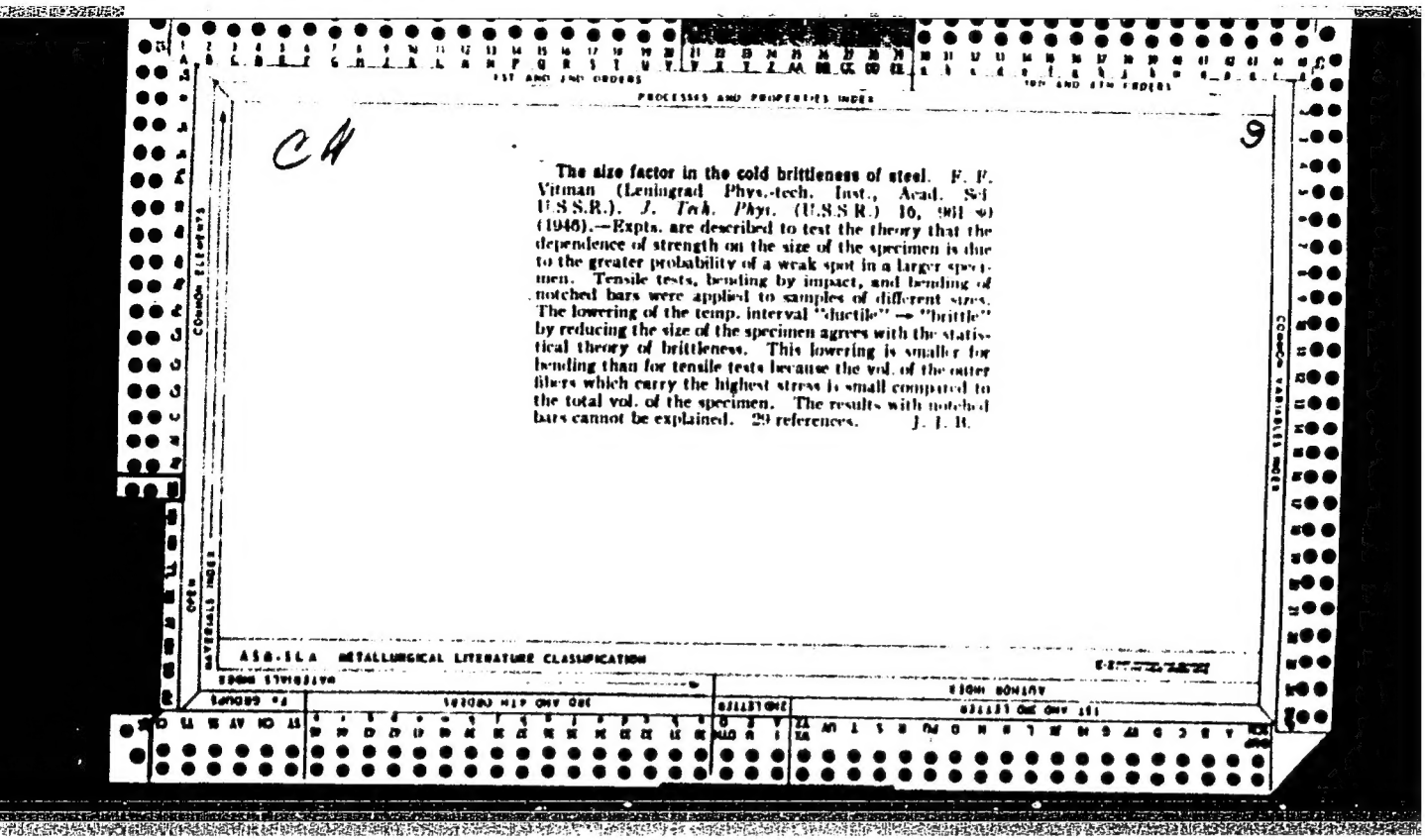

CA

9

The size factor in the cold brittleness of steel. F. F. Vitman (Leningrad Phys.-tech. Inst., Acad. Sci. U.S.S.R.). *J. Tech. Phys.* (U.S.S.R.) 16, 961–9 (1946).—Expts. are described to test the theory that the dependence of strength on the size of the specimen is due to the greater probability of a weak spot in a larger specimen. Tensile tests, bending by impact, and bending of notched bars were applied to samples of different sizes. The lowering of the temp. interval "ductile" → "brittle" by reducing the size of the specimen agrees with the statistical theory of brittleness. This lowering is smaller for bending than for tensile tests because the vol. of the outer fibers which carry the highest stress is small compared to the total vol. of the specimen. The results with notched bars cannot be explained. 29 references. J. J. B.

ASM-TLA METALLURGICAL LITERATURE CLASSIFICATION

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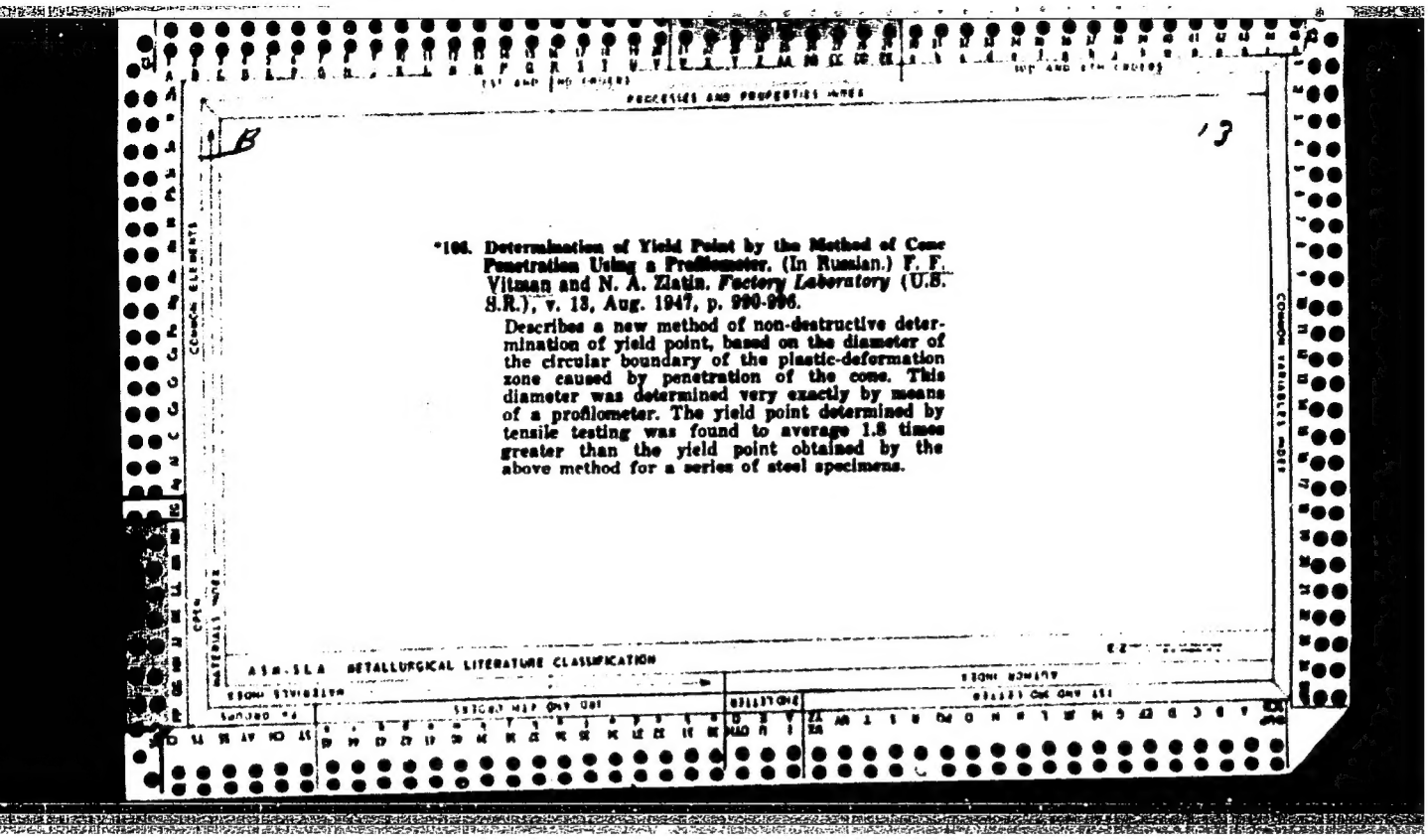

*108. Determination of Yield Point by the Method of Cone Penetration Using a Profilometer. (In Russian.) F. F. Vitman and N. A. Zlatin. *Factory Laboratory* (U.S.S.R.), v. 13, Aug. 1947, p. 990-996.

Describes a new method of non-destructive determination of yield point, based on the diameter of the circular boundary of the plastic-deformation zone caused by penetration of the cone. This diameter was determined very exactly by means of a profilometer. The yield point determined by tensile testing was found to average 1.8 times greater than the yield point obtained by the above method for a series of steel specimens.

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VITMAN, F. F.

Pa-2T37

USSR/Metallurgy Jan 1947
Carbon Steels

"On the Influence of Deformation Velocity on the Cold Brittleness of Steel," F F Vitman, 10 pp

"Zhurn Tekh Fiz" Vol XVII, No 1

Experiments with four kinds of soft and hard carbon steels

2T37

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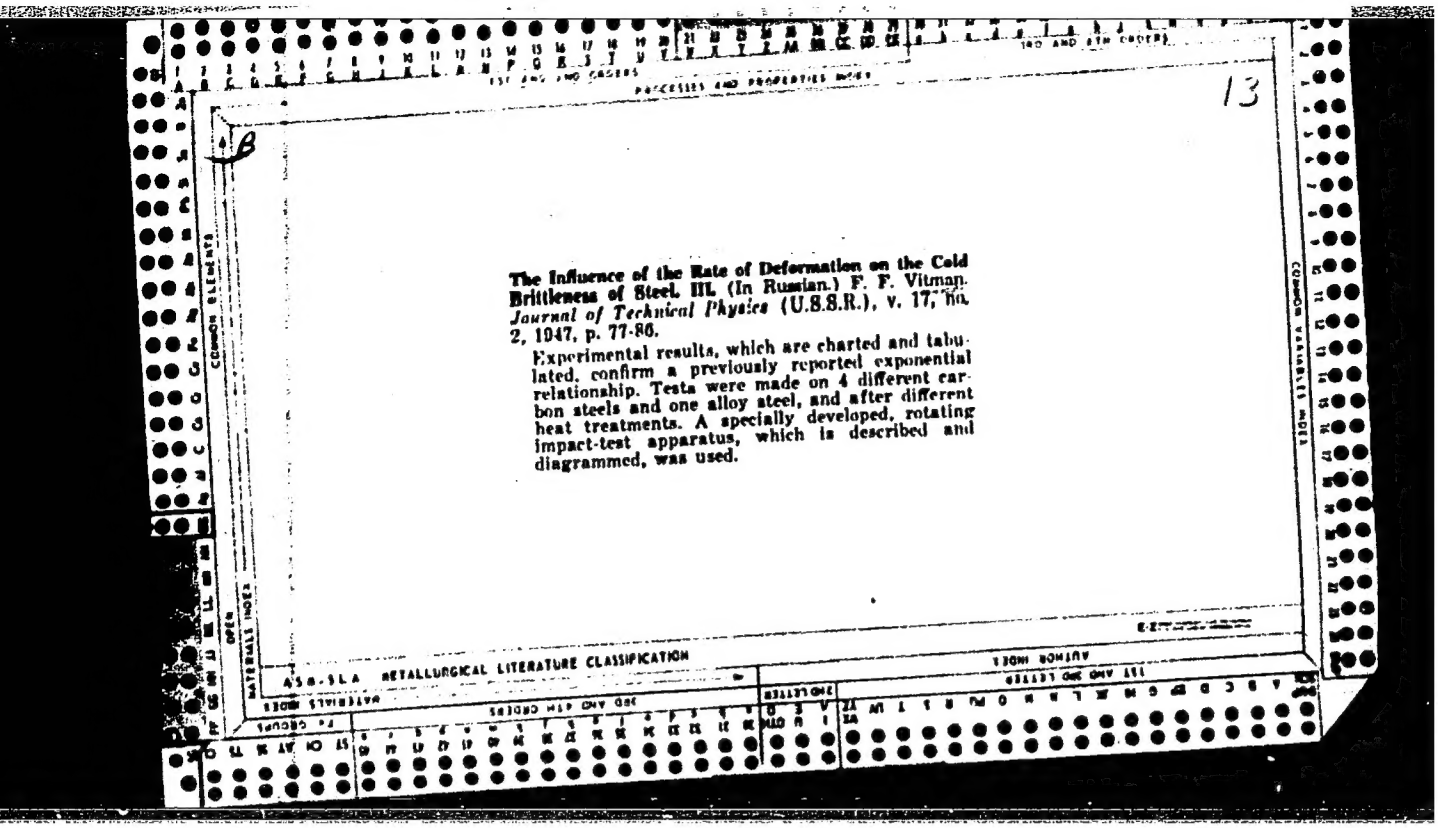

13

B

The Influence of the Rate of Deformation on the Cold Brittleness of Steel. III. (In Russian.) F. F. Vitman. *Journal of Technical Physics* (U.S.S.R.), v. 17, no. 2, 1947, p. 77-86.

Experimental results, which are charted and tabulated, confirm a previously reported exponential relationship. Tests were made on 4 different carbon steels and one alloy steel, and after different heat treatments. A specially developed, rotating impact-test apparatus, which is described and diagrammed, was used.

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

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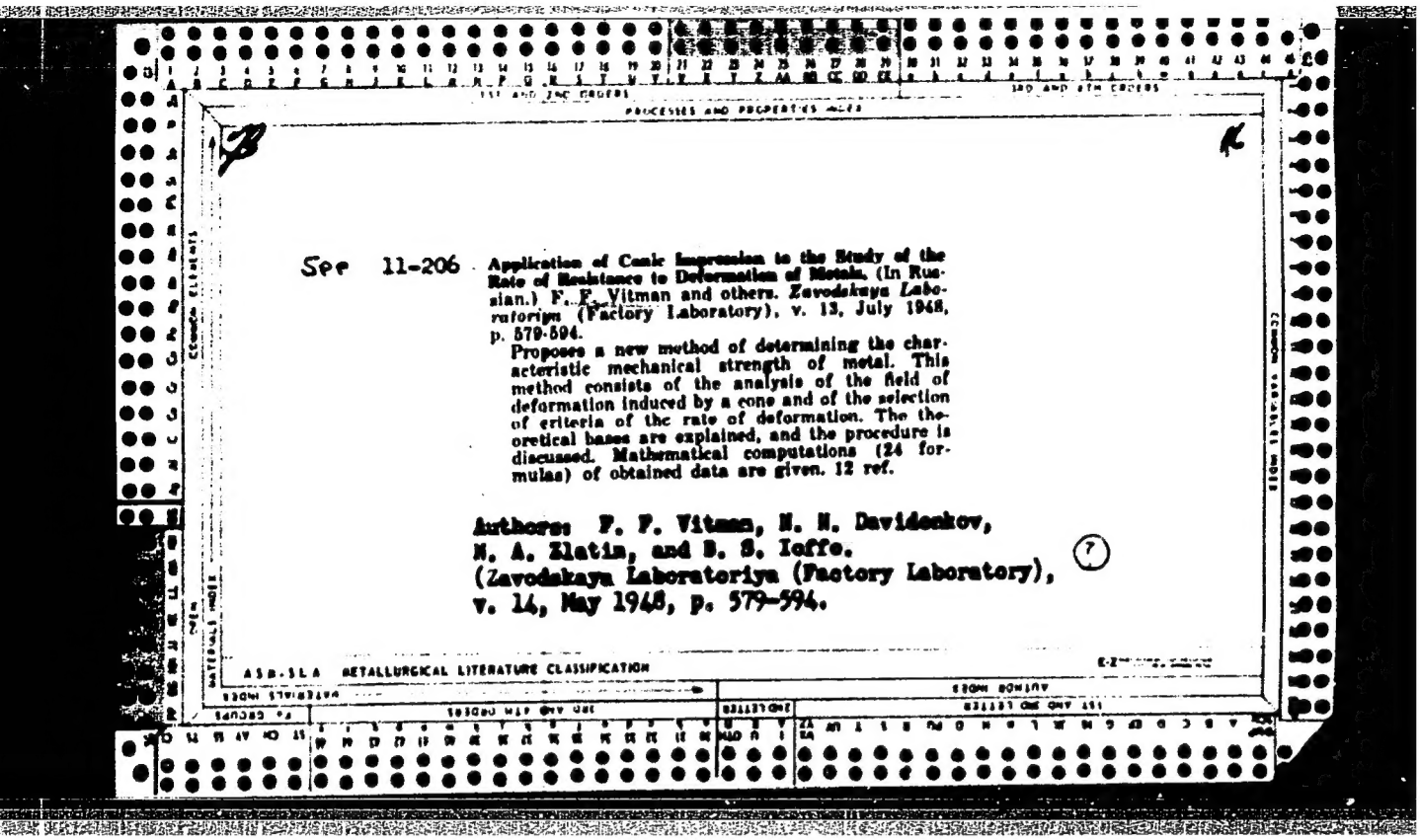

See 11-206 **Application of Conic Impression to the Study of the Rate of Resistance to Deformation of Metals.** (In Russian.) F. F. Vitman and others. *Zavodskaya Laboratoriya* (Factory Laboratory), v. 13, July 1948, p. 579-594.

Proposes a new method of determining the characteristic mechanical strength of metal. This method consists of the analysis of the field of deformation induced by a cone and of the selection of criteria of the rate of deformation. The theoretical bases are explained, and the procedure is discussed. Mathematical computations (24 formulas) of obtained data are given. 12 ref.

Authors: F. F. Vitman, M. M. Davidenkov, N. A. Zlatin, and B. S. Ioffe.
(Zavodskaya Laboratoriya (Factory Laboratory), v. 14, May 1948, p. 579-594.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F. F.

PA 75T87

USSR/Metals May 1948
Testing Procedures
Deformation

"The Use of Conical Impressions for the Study of the Effect of Speed on the Resistance of Metals to Deformation," F. F. Vitman, N. N. Davidenkov, N. A. Zlatin, B. S. Ioffe, Leningrad Phys Tech Inst, Acad Sci USSR, 16 pp

"Zavod Lab" Vol XIV, No 5

Discusses plastic deformation of metals and determination of hardness and yield point by means of conical impressions produced by ballistic pendulum method. Presents mathematical treatment of various effects.

75T87

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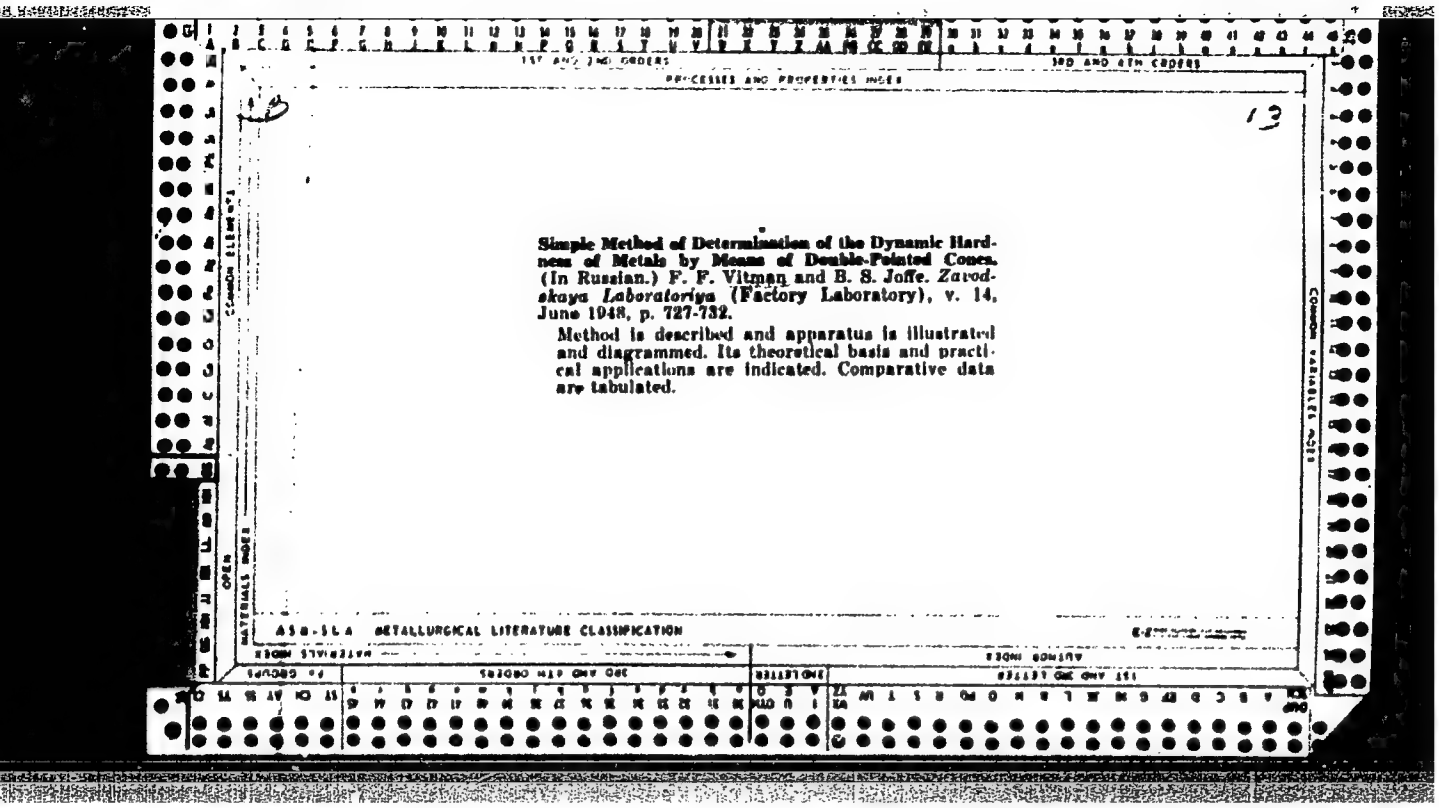

Simple Method of Determination of the Dynamic Hardness of Metals by Means of Double-Pointed Cones. (In Russian.) F. F. Vitman and B. S. Joffe. *Zavodskaya Laboratoriya* (Factory Laboratory), v. 14, June 1948, p. 727-732.

Method is described and apparatus is illustrated and diagrammed. Its theoretical basis and practical applications are indicated. Comparative data are tabulated.

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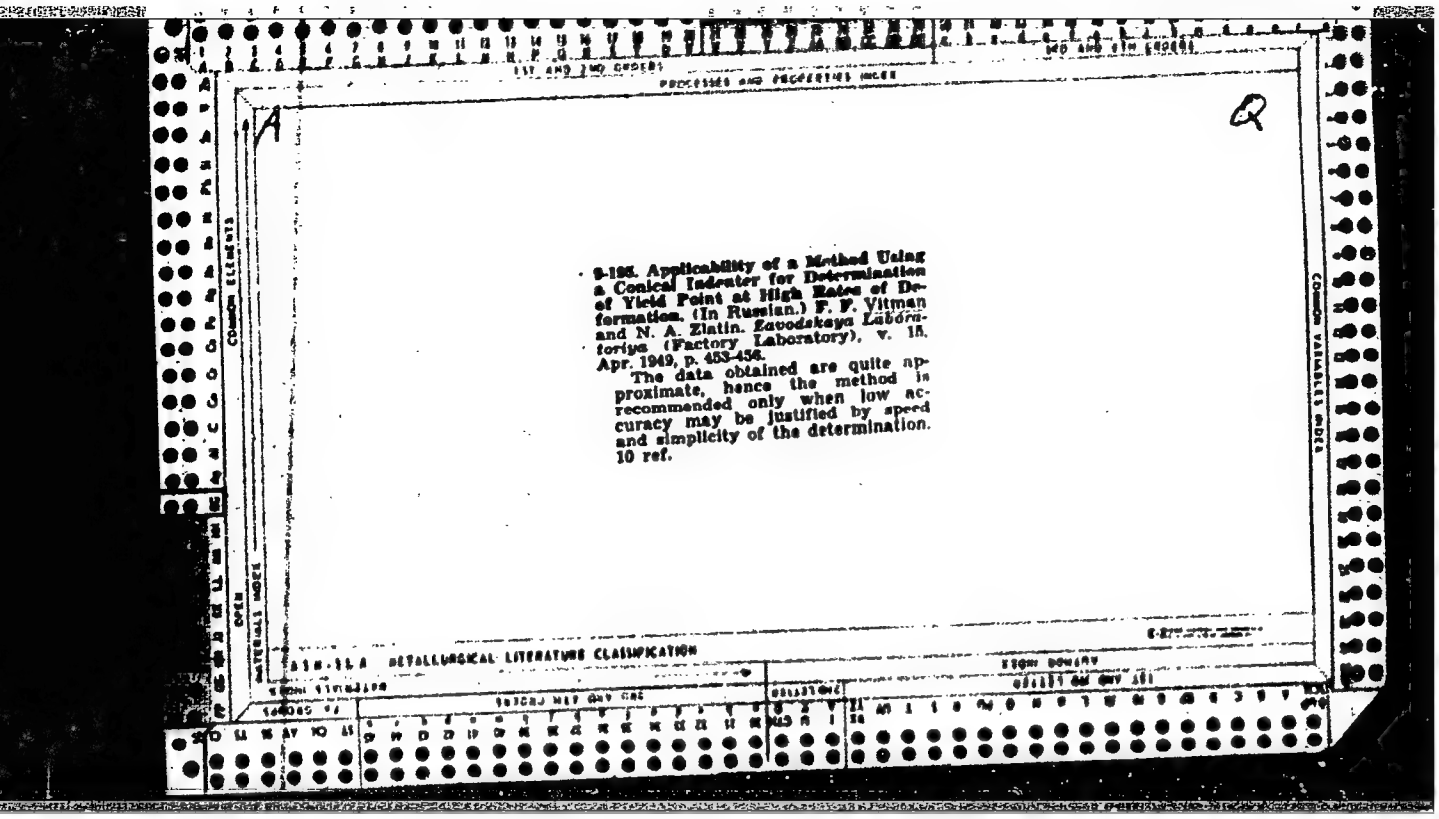

9-198. Applicability of a Method Using a Conical Indenter for Determination of Yield Point at High Rates of Deformation. (In Russian.) F. F. Vitman and N. A. Zlatin. *Zavodskaya Laboratoriya* (Factory Laboratory), v. 15, Apr. 1949, p. 453-456.

The data obtained are quite approximate, hence the method is recommended only when low accuracy may be justified by speed and simplicity of the determination. 10 ref.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

PA 38/49T95

USSR/Metals Mar 49
Deformation
Stress Analysis

"The Resistance of Metals to Deformation for Deformation Rates of 10^{-6} to 10^{2} Meters/Second," F. F. Vitman, N. A. Zlatin, B. S. Iofe, I," F. F. Vitman, N. A. Zlatin, B. S. Iofe, Leningrad Physicotech Inst, Acad Sci USSR, 15 pp

"Zhur Tekh Fiz" Vol XIX, No 3

Introduces simple new method to study dependence of deformation resistance of metals on speed of deformation. Gives results of experiments with lead, aluminum, copper, soft steel, and duralumin

38/49T95

USSR/Metals (Contd) Mar 49

Proves that, within a wide range, variation in deformation rate cannot be the only relationship between resistance-to-deformation and rate. Comparison of experimental results with other data showed that method is fully justifiable. Submitted 25 Nov 48.

Evaluation B-81183

38/49T95

VITMAN, F. F.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

PA 38/49T94

USSR/Metals Mar 49
Deformation
Stress Analysis

"The Resistance of Metals to Deformation for Deformation Rates of 10^{-6} to 10^{2} Meters/Second, II," F. F. Vitman, N. A. Zlatin, Leningrad Physicotech Inst, Acad Sci USSR, 12 pp

"Zhur Tekh Fiz" Vol XIX, No 3

Describes experiments in determining dependence of resistance of lead and soft steel to deformation upon speed of deformation by method of introducing cone at various temperatures. Experimental results indicate presence of variations in rate (10^{-3} to 10^{5} sec^{-1}) in three regions, of the experimental range, each distinguished by the character of the deformation process. Submitted 25 Nov 48.

38/49T94

VITMAN, F. F.

38/49T94

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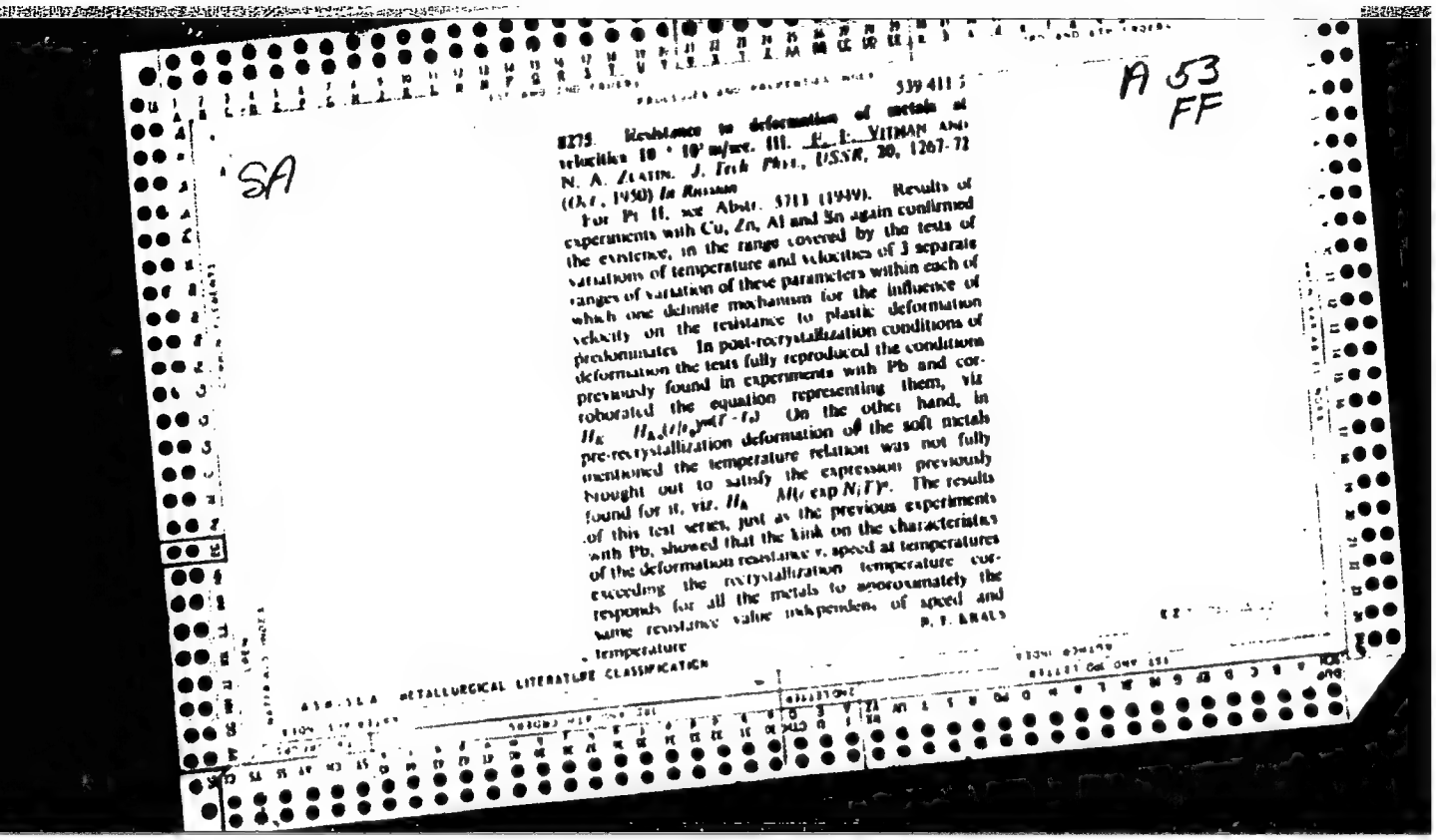

A 53
FF

SA

539 411 5

8275. **Resistance to deformation of metals at velocities 10 · 10³ m/sec. III.** E. I. VITMAN AND N. A. ZLATIN. *J. Tech. Phys., USSR*, 20, 1267-72 (Oct., 1950) *In Russian*

For Pt II, see Abstr. 5713 (1949). Results of experiments with Cu, Zn, Al and Sn again confirmed the existence, in the range covered by the tests of variations of temperature and velocities of 3 separate ranges of variation of these parameters within each of which one definite mechanism for the influence of velocity on the resistance to plastic deformation predominates. In post-recrystallization conditions of deformation the tests fully reproduced the conditions previously found in experiments with Pb and corroborated the equation representing them, viz. $H_K = H_{K_0}(t/t_0)^{m(T-T_0)}$. On the other hand, in pre-recrystallization deformation of the soft metals mentioned the temperature relation was not fully brought out to satisfy the expression previously found for it, viz. $H_K = M(t \exp N/T)^n$. The results of this test series, just as the previous experiments with Pb, showed that the kink on the characteristics of the deformation resistance v. speed at temperatures exceeding the recrystallization temperature corresponds for all the metals to approximately the same resistance value independent of speed and temperature.

P. F. KRAUS

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F. F.

F. F. VITMAN. The work of Andrew and Lee. P. 112 (Letters to the Editor)

Oct. 45, 1950

SO: Journal of Technical Physics, Vol. 21, No. 1 (Jan. 1951)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F. F.

F. F. Vitman. Work concerning the calculation of the residual stresses in thick walled pipes by the N. N. Davidenkov method (J. of Techn. Phys. V No. 9, 1589, 1935). P. 601.

SO: Journal of Technical Physics, Vol. XXI, No. 5, May 1951

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FD 360

VITMAN, F. F.
USSR/Physics - Metals, Mechanical Properties

Card 1/1

Author : Vitman, F. F., Zlatin, N. A., Stepanov, V. A. and Shestopalov, L. M.

Title : Determination of the mechanical properties of metals by means of a small conic indentation and a shallow scratch

Periodical : Zhur. tekh. fiz. 388-399, Mar 1954

Abstract : Experiments with a variety of metals are used to show that characteristics such as yield point, tensile strength and actual breaking point may be determined by means of a small conic indentation and a short superficial scratch. Critical review of literature on the subject is included.

Institution :

Submitted : October 10, 1953

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F. F.
USSR, Physics - Metals, Mechanical Properties

FD 378

Card 1/1

Author : Vitman, F. F., Zlatin, N. A., Ioffe, B. S., Shestopalov, L. M.

Title : Determination of the mechanical properties of metals at elevated temperatures by means of a small conical indentation and a shallow scratch

Periodical : Zhur. tekh. fiz. 24, 549-559, Mar 1954

Abstract : Describes equipment for determining in vacuum mechanical properties of metals, demonstrating possibility of using method of small conical indentation for determining yield point and ultimate strength in the region of elevated temperatures. Establishes also that determination of tensile strength by means of short shallow scratches is infeasible at high temperatures. Seven references, all USSR; one 1935, others 1949-1952. Graphs, illustrations.

Institution :

Submitted : October 6, 1953

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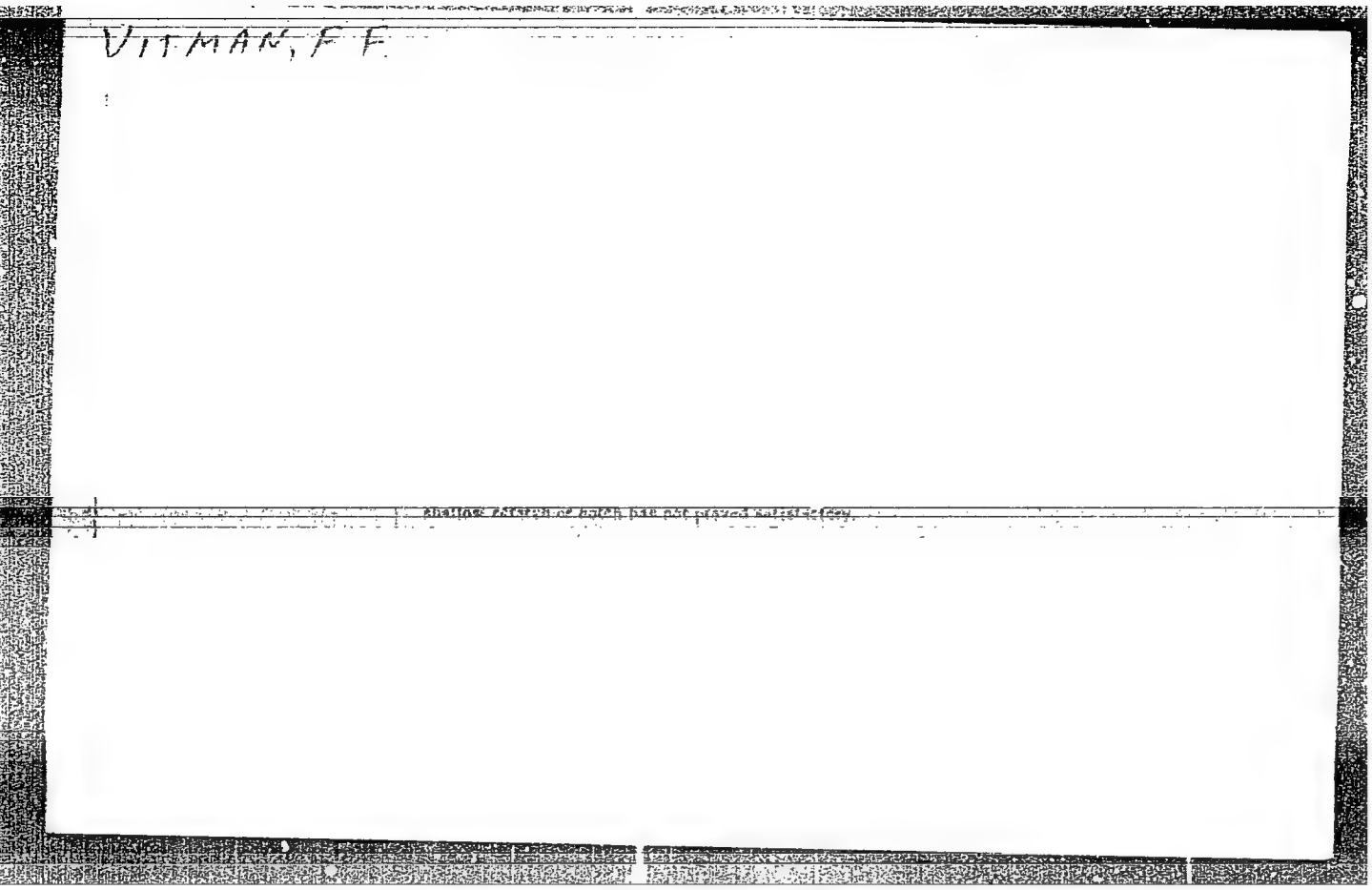

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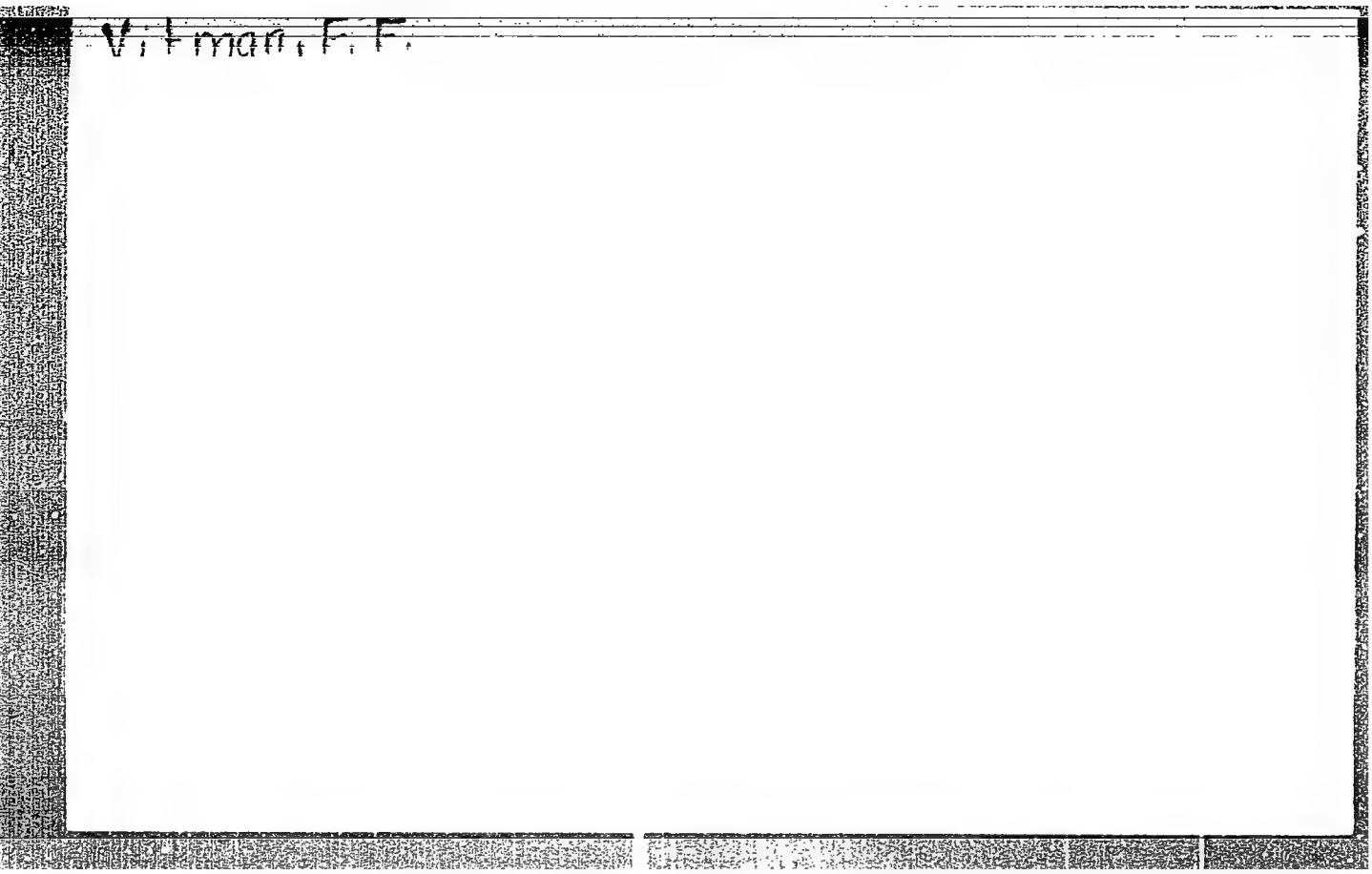

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A006/A001

Translation from: Referativnyy zhurnal, Khimiya, 1960, No. 14, p. 362, # 57934

AUTHORS: Vitman, F.F., Zhurkov, S.N., Levin, B.Ya., Pukh, V.P.

TITLE: On the Problem of Raising the Strength of Glass

PERIODICAL: V sb.: Nekotoryye probl. prochnosti tverdogo tela Moscow-Leningrad AN SSSR, 1959, pp. 340 - 347

TEXT: The possibility is shown of doubling the strength of hardened sheet glass (BB(VV) glass specimens and "rolled" glass from the Konstantinovka "Avtosteklo" Plant) by removing their surface defects by etching in HF solution after hardening. Average strength values of glass as high as 60-80 kg/mm^2 were obtained.

I. Mikhaylova

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

DAVIDENKOV, N.N., akademik; VITMAN, F.F., prof., doktor fiz.-mat.nauk; GLIKMAN, L.A., prof., doktor tekhn.nauk; FRIDMAN, Ya.B., prof., doktor tekhn.nauk; MIROLYUBOV, I.N., kand.tekhn.nauk; ROZOV, I.A., mladshiy nauchnyy sotrudnik

Evgenii Mikhailovich Shevandin; obituary. Zav.lab. 25 no.7:896 '59. (MIRA 12:10)

1. AN USSR (for Davidenkov).
(Shevandin, Evgenii Mikhailovich)

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VITMAN F.F.

28(6) PHASE I BOOK EXPLOITATION SOV/2935

Akademiya nauk SSSR

Prochnost' tverdogo tela; sb.nauk statey (Some Problems in the Strength of Solids; Collection of Articles) Moscow, Izd-vo AN SSSR, 1959. 366 p. Errata slip inserted. 2,000 copies printed.

Ed. of Publishing House: V. I. Averbukh, Candidate of Physical and Mathematical Sciences; Ed. of Publishing Board: A.P. Yefa, Academician; G. V. Kurdyumov, Academician; B. F. Vitman, Corresponding Member, USSR Academy of Sciences; F. F. Vitman, S. E. Zhurkov, Corresponding Member, USSR Academy of Sciences; Ya. B. Fridman, Doctor of Physical and Mathematical Sciences, Professor (Resp. Ed.); L. A. Shuvalov, Doctor of Physical and Mathematical Sciences, Professor; M. A. Il'in, Doctor of Technical Sciences, Professor; N. A. Shapkov, Doctor of Technical Sciences; V. A. Stepanov, Doctor of Technical Sciences; N. N. Davidenkov, Doctor of Technical Sciences, Professor; N. S. Ioffe, Physical and Mathematical Sciences; Ya. B. Fridman, Doctor of Technical Sciences, Professor; N. S. Ioffe, Candidate of Technical Sciences (Deputy Resp. Ed.).

PURPOSE: This book is intended for construction engineers, technologists, physicists and other persons interested in the strength of materials.

COVERAGE: This collection of articles was compiled by the Otdeleniye fiziko-matematicheskikh nauk AN SSSR (Department of Physical and Mathematical Sciences) and the Fiziko-mekhanicheskiy institut AN SSSR (Institute of Applied Physics, Academy of Sciences, USSR) in commemoration of the 80th birthday of Nikolay Nikolayevich Davidenkov, Member of the Ukrainian Academy of Sciences, founder and head of the Otdel prochnosti materialov (Department of the Strength of Materials) at the Institute of Applied Physics, Academy of Sciences, USSR, founder of the Fiziko-mekhanicheskiy institut (Leningrad Polytechnic Institute), recipient of the Stalin Prize (1941), the Order of the Red Banner of Labor (1945) and the Order of Lenin (1953). The articles deal with the strength of materials, phenomena of deformation, hydrogen embrittlement, cold brittleness, fatigue of metals, and action speed tests of the strength, plasticity, and mechanical properties of materials; on the mechanical properties of materials, and introductory profile general problems of the strength, plasticity, and mechanical properties are mentioned in the end of each article. Numerous personalities are mentioned in the text of Professor Davidenkov. References are given at the end of each article.

Burak, L.M., and Th.D. Shmigl. Investigation of the Hydrogen Embrittlement of Two-Phase Titanium Alloys 140

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VITMAN, F.F.

24(6) PHASE I BOOK EXPLOITATION SOV/2385

Akademiya nauk SSSR

Prochnost' pri dinamicheskikh nagruzkakh; sbornik statey (Some Problems in the Strength of Solids; Collection of Articles) Moscow, Izd-vo AN SSSR, 1959. 366 p. Errata slip inserted. 2,000 copies printed.

Ed. of Publishing House: V. I. Averbukh; Tech. Ed.: R. S. Pevzner

Editorial Board: A.F. Ioffe, Academician; G. V. Kuznetsov, Academician; S. N. Zhurkov, Corresponding Member, USSR Academy of Sciences; N. P. Yemel'yanov, Corresponding Member, USSR Academy of Sciences; Ye. F. Fitman, Doctor of Physical and Mathematical Sciences; F. F. Vitman, Doctor of Technical Sciences, Professor (Resp. Ed.); L. A. Galkina, Doctor of Technical Sciences, Professor; M. A. Zlatin, Doctor of Physical and Mathematical Sciences; Professor; M. A. Stepanov, Doctor of Technical Sciences; Ya.B. Fridman, Doctor of Physical and Mathematical Sciences; V. A. Stepanov, Doctor of Technical Sciences, Professor; I. S. Ioffe, Candidate of Technical Sciences (Deputy Resp. Ed.).

PURPOSE: This book is intended for construction engineers, technologists, physicists and other persons interested in the strength of materials.

COVERAGE: This collection of articles was compiled by the Otdelniye fiziko-matematicheskikh nauk AN SSSR (Department of Physical and Mathematical Sciences) and the Fiziko-tekhnicheskiy institut AN SSSR (Institute of Applied Physics, Academy of Sciences, USSR) in commemoration of the 80th birthday of Mikhaylovich Davidenkov, Member of the Ukrainian Academy of Sciences, founder and head of the Otdel prochnosti materialov (Department of the Strength of Materials) at the Institute of Applied Physics, Academy of Sciences, USSR, founder of the Fakul'tet fiziki tverdogo tela i kvantovoy elektroniki (Department of Physical Electronics) at the Leningradskiy politekhnicheskiy institut (Leningrad Polytechnic Institute), recipient of the Stalin Prize (1943), the Order of the Red Banner of Labor (1945) and the Order of Lenin (1955). The articles deal with the strength of materials, phenomena of imperfect elasticity, temperation speed on the mechanical properties of materials, fatigue of metals, and brittleness, hydrogen embrittlement, cold brittleness, influence of deformation general problems of the strength, plasticity, and mechanical properties of materials. Numerous personalities are mentioned in the introductory article of Professor Davidenkov. References are given at the end of each article.

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VITMAN, F.F.

SOV/32-25-7-50/50

28(5)

AUTHORS: Davidenkov, N. N. Academician of the AS USSR, Vitman, F. F. Professor, Doctor of Physical and Mathematical Sciences, Glikman, L. A. Professor, Doctor of Technical Sciences, Fridman, Ya. B. Professor, Doctor of Technical Sciences, Mirolyubov, I. N. Candidate of Technical Sciences, Razov, I. A. Junior Scientific Collaborator

TITLE: Yevgeniy Mikhaylovich Shevandin (Yevgeniy Mikhaylovich Shevandin)

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 7, p 896 (USSR)

ABSTRACT: This is an obituary written on the occasion of the death of the scientist mentioned in the title. Shevandin was one of the leading scientists in the field of material mechanics; he became famous for his investigations of the nature of destruction by brittleness and the phenomena of destruction by brittleness of metals at low temperatures carried out at the Fiziko-tekhnicheskiy institut (Physical and Technical Institute). After 1945 the deceased dealt with the problems of cold-shortness of ferrous metals which are of great importance in ship-building. Ye. M. Shevandin published two manuals on the mechanical properties of metals as well as

Card 1/2

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Yevgeniy Mikhaylovich Shevandin SOV/32-25-7-50/50

more than 50 original papers. His monograph "Tendency of Low-alloy Steels Towards Brittleness" was published in 1953.

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VITMAN, F.F., prof., doktor fiz.-mat.nauk, otv.red.; IOFFE, A.F., akademik; red.; KURDYUMOV, G.V., akademik, red.; ZHURKOV, S.N., red.; KONSTANTINOV, B.P., red.; GLIKMAN, L.A., prof., doktor tekhn. nauk, red.; ZLATIN, N.A., doktor fiz.-mat.nauk, red.; STEPANOV, V.A., doktor tekhn.nauk, red.; FRIDMAN, Ya.B., prof., doktor tekhn.nauk, red.; IOFFE, B.S., kand.tekhn.nauk, red.; AVER'YANOV, V.I., red.izd-va; PEVZNER, R.S., tekhn.red.

[Some problems on the strength of solid bodies; collection of articles dedicated to the 80th birthday of N.N.Davidenkov, member of the Academy of Sciences of the Ukrainian S.S.R.] Nekotorye problemy prochnosti tverdogo tela; sbornik statei, posviashchennyi vos'midesiatiletiiu akademika AN USSR N.N.Davidenkova. Moskva, 1959. 386 p. (MIRA 12:6)

1. Akademiya nauk SSSR. 2. Chlen-korrespondent AN SSSR (for Zhurkov, Konstantinov).
(Strength of materials)

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VITMAN, F.F.; IOFFE, B.S.; PUGACHEV, G.S.

Penetration of short stress impulses from rigid to plastic rods.
Fiz. met. i metalloved. 10 no.3:435-444 S '60. (MIRA 13:10)

1. Fiziko-tekhnicheskiy institut AN SSSR.
(Strains and stresses) (Elastic waves)

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TUMANOV, A.T., zasluzhennyy deyatel' nauki i tekhniki RSFSR;
DAVIDENKOV, V.V., akademik; SERENSEN, S.V., akademik;
KURDYUMOV, G.V., akademik; BOCHVAR, A.A., akademik;
KISHKIN, S.T.; ZAYMOVSKIY, A.S.; SHCHAPOV, N.P., prof.;
KUDRYAVTSEV, I.V., prof.; VITMAN, F.F., prof.; KISHKINA,
S.I., prof.

IAkov Borisovich Fridman; on the fiftieth anniversary of his birth. Zav.lab. 27 no.7:919-920 '61. (MIRA 14:7)

1. Akademiya nauk USSR (for Davidenkov, Serensen). 2. Chleny-korrespondenty Akademii nauk SSSR (for Kishkin, Zaymovskiy).
(Fridman, IAkov Borisovich, 1911-)

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15 2610

25330

AUTHORS: Boguslavskiy, I. A., Vitman, F. F., and Pukh, V. P.

TITLE: Increase of the strength of thin glass

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 138, no. 5, 1961, 1059-1061

TEXT: Two methods have recently been proposed for improving the strength of glass: hardening and chemical etching. Hardening and subsequent etching have also been studied in detail. However, these methods are only suitable for glass having a thickness of more than 5 mm. The strength of glass 1.5-3.0 mm thick is not considerably improved by hardening in air. Etching of such glass, however, raises their average strength to 50-60 kg/cm^2. These values are only slightly lower than those obtained for thick glass. The authors present the results of experiments made with glass specimens having dimensions of 80·80 mm and a thickness of 1.5, 3.0, and 5.0 mm. The specimens had non-processed and mechanically polished surfaces, and were treated a) thermochemically, b) by etching with hydrofluoric acid solution, and c) by applying both methods successively. In the first method, the specimens were placed perpendicularly in a tem-

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pering furnace and heated to a temperature slightly above that at which the glass softens. After 2-3 min the specimens were cooled in silicone oil and air. In the second method, a layer of 0.1 mm was removed from the surface of the specimens by etching in 20% hydrofluoric acid. The third method combines the first two procedures. The results of the tests are shown in figs. 1 and 2. The combined method (thermochemical treatment followed by etching) is shown to furnish the best results. It ensures a strength of 70-80 kg/cm^2. Optimum results were obtained for 1.5-mm glass whose surface had not been processed and which had a relatively high initial strength. The factors increasing the strength of glass are still unknown. It is believed that strength-reducing flaws in the surface layer are eliminated by etching or by thermochemical treatment. The rapid cooling in a liquid organo-silicon medium is likely to change the distribution of hardening strains across the thickness of the glass specimen which, in turn, gives rise to strong compressing forces in the surface layer. On the other hand, it is also necessary to take into account the effect of the hydrophobic layer which is formed on the surface of the glass specimen while being cooled in silicone oil, as well as the interaction of the strongly heated glass with the organo-silicon compounds. By

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Increase of the strength of ... 25310 S/020/61/138/005/010/025
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using liquids that allowed the glass to be cooled more rapidly, it was possible to reach a bending strength of 100-120 kg/mm^2 for glass of 5 mm thickness. The bending strength could be raised up to 150 kg/mm^2 by reducing the thickness of the glass. There are 2 figures and 8 Soviet-bloc references.

ASSOCIATION: Fiziko-tekhnicheskiy institutim. A. F. Ioffe Akademii nauk SSSR (Institute of Physics and Technology imeni A. F. Ioffe of the Academy of Sciences USSR); Gosudarstvennoye spetsial'noye proyektno-konstruktorskoye byuro po steklu (State Special Planning and Design Office for Glass)

PRESENTED: February 13, 1961, by B. P. Konstantinov, Academician

SUBMITTED: January 24, 1961

Card 3/5

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

BOGUSLAVSKIY, I.A.; VITMAN, F.F.; PUKH, V.R.

Raising the strength of thin glass. Dokl.AN SSSR 138 no.5:1062-1065 Je '61. (MIRA 14:6)

1. Fiziko-tekhnicheskiy institut im. A.F.Ioffe AN SSSR i Gosudarstvennoye spetsial'noye proyektno-konstruktorskoye byuro po steklu. Predstavleno akademikom B.P.Konstantinovym.
(Glass manufacture) (Strength of materials)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F.F.; ZLATIN, N.A.

Comments of IU.IA.Voloshenko-Klimovitskii's article "Regularities in the changes of the yield point at high loading speeds and low temperatures." Izv.AN SSSR.Otd.tekh.nauk.Mekh.i mashinostr. no.6:175 N-D '62. (MIRA 15:12)

(Low temperature research) (Voloshenko-Klimovitskii, IU.IA.)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

39973
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B125/B102

15,2120

AUTHORS: Vitman, F. F., Dmitriyeva, T. G., and Pukh, V. P.

TITLE: Residual stresses in glasses quenched in liquids

PERIODICAL: Fizika tverdogo tela, v. 4, no. 8, 1962, 2151-2159

TEXT: Complete diagrams plotted by the strip and the plate methods, are given for the residual stresses in glasses of 1.5, 3, 5, 8, and 12 mm thickness treated by the process of S. I. Sil'vestrovich and I. A. Boguslavskiy (DAN SSSR, 129, no. 6, 1362, 1959; author's certificate. 132374, 1959). Mechanical measurements of residual stresses clearly proved the advantages of glass quenching in liquids, indicating that this method of quenching ought to be further developed. Thin glasses poorly quenched in air blasts have the same quenching stresses, after a second liquid quenching, as thick glasses after a quenching of 3-4 por./cm. Considerably higher compressive stresses occur on the surface of thick liquid-quenched glasses. They are higher than when the glasses are quenched in air blasts for the same period. Since under these conditions the optical stress measurement is not reliable it should be replaced by

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Residual stresses in glasses ...

a mechanical measurement of the residual stress. Quenching causes higher stresses in square glass plates than in prismatic glass strips. The stresses in quenched glasses can be better determined by mechanically measuring the residual stresses in plates (biaxial state of stress) than by the customary method using specimens in the form of strip. There are 8 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad (Physicotechnical Institute imeni A. F. Ioffe AS USSR, Leningrad)

SUBMITTED: March 23, 1962

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39974
S/181/62/004/008/016/041
B125/B102

AUTHORS: Vitman, F. F., Boguslavskiy, I. A., and Pukh, V. P.

TITLE: Glass hardening

PERIODICAL: Fizika tverdogo tela, v. 4, no. 8, 1962, 2160-2168

TEXT: Glasses were tested after being hardened in the following ways: (1) by quenching in polysiloxane liquids and in mineral oils; (2) by etching in hydrofluoric solutions, and (3) by quenching with subsequent etching. In each case the specimens were of vertically drawn glass, measuring 80 mm square and of 1.5, 3.0, and 5.0 mm thickness, with both natural and mechanically polished surfaces. The strength of the glass plates 1.5 to 3.0 mm thick was found to be only slightly increased by quenching in air blasts. The strength of those 5 to 6 mm thick can be increased, by quenching in organosilicon oils or in mineral oils, from 10-20 kg/mm^2 up to 30-80 kg/mm^2. By subsequent etching in hydrofluoric solutions it can be to 60 to 125 kg/mm^2. By this method of hardening the strength of the glass plates 1.5-3.0 mm thick could be increased to the anprecedented level of 50 kg/mm^2. Glass hardening by quenching in air

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Glass hardening

blasts and liquids is due to compressive stresses generated in the surface and largely to physical changes produced in the surface layer of the glass. The contribution of these physical changes to hardening is the greater the more rapidly the gas is cooled. This two-stage hardening process is well suited for the commercial production of large glasses and for various engineering purposes. There are 3 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad (Physicotechnical Institute imeni A. F. Ioffe, AS USSR, Leningrad)

SUBMITTED: March 22, 1962

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L 22896-65 EWT(m)/EWP(w)/EWA(d)/EPR/T/EWP(t)/EWP(b) Pe-4 IJP(c)

MJW/JD

ACCESSION NR: AP5001241 S/0126/64/018/005/0717/0723

AUTHOR: Vitman, F. F.; Ivanov, M. I.; Ioffe, B. S.

TITLE: Rupture strength of ductile metals subjected to pulsed loading

SOURCE: Fizika metallov i metallovedenive, v. 18, no. 5, 1964, 717-723

TOPIC TAGS: rupture strength, ductile metal, steel strength, iron strength, copper strength, aluminum strength [illegible]

ABSTRACT: The aim [illegible] this paper was [illegible] the existing data on the rupture [illegible]

[illegible] obtained raises several questions of [illegible] interest (dependence of rupture

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ACCESSION NR: AP5001241

strength on composition and structural state, nature of failure observed, etc.) which can be answered if more adequate stress -measurement methods and analyses of the processes occurring in the crystal lattice are employed. Orig. art. has: 12 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR (Physicotechnical Institute, AN SSSR)

SUBMITTED: 20May63 ENCL: 00 SUB CODE: MM

NO REF SOV: 009 OTHER: 017

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F.F.; BARTENEV, G.M.; PUKH, V.P.; TSEPKOV, L.P.

Method of measuring the strength of sheet glass. Stek. i ker. 19 no.8:9-11 Ag '62. (MIRA 15:9)
(Glass--Testing)

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

S/020/62/145/001/012/018
B104/B102

AUTHORS: Vitman, F. F., Boguslavskiy, I. A., and Pukh, V. P.

TITLE: Glass hardening

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 1, 1962, 85-88

TEXT: Glass hardness of up to 100 kg/mm^2 can be achieved by quenching the glass in liquids or air and then etching it. The authors discuss papers from the years 1933 through 1961 which deal with glass hardening methods. They conclude that in glass hardening great significance attaches not only to the hardening stresses but also to the structural state of the glass surface. There is 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences USSR). Gosudarstvennoye spetsial'noye proyektno-konstruktorskoye byuro po steklu VSNKh RSFSR (State Special Planning and Designing Bureau of Glass VSNKh RSFSR)

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B104/B102

Glass hardening

PRESENTED: January 20, 1962, by B. P. Konstantinov, Academician

SUBMITTED: January 3, 1962

Card 2/2

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17,1107 (3707,2623)

40564
S/020/62/146/002/005/013
B104/B108

AUTHORS: Vitman, F. F., Zlatin, N. A.

TITLE: A problem of the collision of plastic bodies

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 146, no. 2, 1962, 337 - 339

TEXT: The collision of a plastic solid of revolution (2) with a plastic semispace (1) is studied on the assumption that the axis and the velocity vector of (2) coincide with the surface normal to the semispace. The problem is solved in terms of the theory of dimensions (L. I. Sedov, Metody podobiya i razmernosti v mekhanike - Methods of similitude and dimensions in mechanics, M., 1957). The parameters of the shock adiabate are used to allow for the compressibility of the two bodies, a linear relation being assumed to exist between the velocity D of the shock wave and the mass velocity u behind the wave front. The pressure behind the wave front is then $p = \rho_0 Du = \rho_0(a + bu)u$, where a and b are constants of the material, determined from the shock adiabate, and ρ_0 is the density at standard pressure. The process is described by the impact velocity v_0, the

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A problem of the collision...

dynamic hardnesses H_1 and H_2, the densities ρ_{01} and ρ_{02} at standard pressure, the cohesion energies Q_1 and Q_2, the compressibility characteristics a_1, a_2, b_1 and b_2, the diameter d_0 of the characteristic cross section, the characteristic length l_0 of the body (2), and by the depth L_k of the indent resulting from the collision in (1). In accordance with the π-theorem of the theory of dimensions, the 15 parameters stated above may be replaced by 12 dimensionless combinations. An implicit equation for the process under consideration can be derived from the functional relation between these combinations:

$$\frac{L_k}{l_0} = f\left(\frac{\rho_{01}v_0^2}{H_1}, \frac{H_2}{H_1}, \frac{\rho_{02}}{\rho_{01}}, k_0, \frac{l_0}{d_0}, a_1\sqrt{\frac{\rho_{01}}{H_1}}, \frac{\rho_{02}a_2}{\sqrt{\rho_{01}H_1}}, b_1, \frac{\rho_{02}b_2}{\rho_{01}}, \frac{\rho_{01}Q_1}{H_1}, \frac{Q_2}{Q_1}\right). \quad (2),$$

which, according to Sedov, can be reduced to

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

A problem of the collision...

$$\frac{L_w}{l_0} = F\left(\frac{\rho_{01}v_0^2}{H_1}, \frac{H_2}{H_1}, \frac{\rho_{02}}{\rho_{01}}, k_0, \frac{l_0}{d_0}, a_1\sqrt{\frac{\rho_{01}}{H_1}}, \frac{\rho_{02}a_2 - \rho_{01}a_1}{\sqrt{\rho_{01}H_1}}, b_1, \frac{\rho_{02}b_2 - \rho_{01}b_1}{\rho_{01}}, \frac{\rho_{01}Q_1}{H_1}, \frac{Q_2}{Q_1}\right) \quad (3),$$

whence

$$\frac{L_w}{l_0} \simeq \Phi\left(\frac{\rho_{01}v_0^2}{H_1}, \frac{H_2}{H_1}, \frac{\rho_{02}}{\rho_{01}}, k_0, \frac{l_0}{d_0}, \frac{\rho_{01}a_2 - \rho_{02}a_1}{\sqrt{\rho_{01}H_1}}, \frac{\rho_{02}b_2 - \rho_{01}b_1}{\rho_{01}}, \frac{\rho_{01}Q_1}{H_1}, \frac{Q_2}{Q_1}\right). \quad (4)$$

is obtained on the assumption that $a_1\sqrt{\vartheta_{01}/H_1} \simeq$ const and $b_1 \simeq$ const. The form of (4) is considered for five particular conditions of impact.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences USSR)

PRESENTED: January 8, 1962, by B. P. Konstantinov, Academician

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

A problem of the collision...

S/020/62/146/002/005/013
B104/B108

SUBMITTED: January 3, 1962

Card 4/4

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

L 18105-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD

ACCESSION NR: AP3001707 S/0126/63/015/005/0796/0798

57
55

AUTHORS: Vitman, F. F.; Zlatin, N. A.

TITLE: Regular changes in flow limit at rapid loading rates and low temperatures

SOURCE: Fizika metallov i metallovedeniye, v. 15, no. 5, 1963, 796-798

TOPIC TAGS: flow limit, change , rapid loading, low temperature

ABSTRACT: This is a short answer to the criticism of the formula derived by the authors, expressing a relation between the flow limit (σ_T), deformation speed ($\dot{\varepsilon}$) and temperature (T):

$$\sigma_T = D(\dot{\varepsilon} e^{\frac{B}{T}})^n, \quad (1)$$

where D, B and n are the material constants. The authors support validity of this formula by experimental results obtained with a brittle soft steel. The conclude that the formula satisfies the experimental data at temperatures below recrystallization, providing that the deformation process is of an isothermal nature and is

Card 1/2

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

L 18105-63
ACCESSION NR: AP3001707

2

not accompanied by phasal transformations.[16] Orig. art. has: 1 formula and 2 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR im. A. F. Ioffe (Institute of Physics and Technology, Academy of Sciences, SSSR)

SUBMITTED: 19Aug62 DATE ACQ: 11Jul63 ENCL: 00

SUB CODE: ML NO REF SOV: 012 OTHER: 000

Card 2/2

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F.F., doktor fiz.-matem. nauk; PUKH, V.P., kand. tekhn. nauk

Economic expediency in the production of window glass with improved strength. Stek. i ker. 20 no.10:4-8 O '63.
(MIRA 16:10)

1. Fiziko-tekhnicheskiy institut imeni A.F. Ioffe AN SSSR.
(Plate glass)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F.F.; PUKH, V.P.

Methods for evaluating the strength of sheet glasses. Zav.lab. 29 no.7:863-867 '63. (MIRA 16:8)

1. Leningradskiy fiziko-tekhnicheskiy institut im. A.F.Ioffe.
(Plate glass--Testing)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F.F.; ZLATIN, N.A.

Collisions of deformable bodies and simulating the process. Part 1. Zhur. tekh. fiz. 33 no.8:982-989 Ag '63. (MIRA 16:11)

1. Fiziko-tekhnicheskiy institut imeni A.F.Ioffe AN SSSR, Leningrad.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

BELYAKOV, L.V.; VITMAN, F.F.; ZLATIN, N.A.

Collisions of deformable bodies and simulating the process. Part 2. Zhur. tekh. fiz. 33 no.8:990-995 Ag '63. (MIRA 16:11)

1. Fiziko-tekhnicheskiy institut imeni A.F.Ioffe AN SSSR, Leningrad.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F. F. and KHEKHOVSKIY, S. M.

"Structural physical factors and basic scientific problems in the strengthening of glasses and sitalls"

(Physicotechnical Institute, Academy of Sciences USSR)

At the Division of Physical Chemistry and Technology of Inorganic Materials, Acad. Sci. USSR, a scientific council on the problem of sitalls has been established. The Council is a coordinating body for basic scientific research on sitalls, glass, fiber glass, stoneware, refractory and superrefractory materials, and coatings. The purpose of the Council is primarily to contribute to the improvement of the strength and impact resistance of existing materials. In 1963, the council held two sessions.

(Steklo i keramika, no. 6, 1964, 48-49)

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

S/0181/64/006/004/1089/1095

ACCESSION NR: AP4028435

AUTHORS: Vitman, F. F.; Krautman, V. R.; Pukh, V. P.

TITLE: The strength of sheet glass and the scale factor

SOURCE: Fizika tverdogo tela, v. 6, no. 4, 1964, 1089-1095

TOPIC TAGS: sheet glass, crushing strength, scale factor, glass hardening, tester UM 5

TOPIC TAGS: Strength was measured by a UM-5 apparatus on samples 40 x 40 x 2.2 mm, by a weight-applying device for smaller sizes, and by a pneumatic machine for larger sizes. The duration of loading (till breakage) was the same for all samples (10-30 sec). The authors have shown that the strength of sheet glass hardened by etching in solutions of fluoric acid and also the strength of untreated glass depend markedly on the dimensions of the working (uniformly loaded) surface of the sample. When this surface is increased by a factor of 100 000, the strength is decreased several times. The authors investigate the statistical nature of this effect and show that it may be less noticeable, or even entirely absent, if the glass surface has an accumulation of defects strongly affecting the general dimensions of the

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

ACCESSION NR: AP4028435

statistical function of defect distribution on the glass surface. The breaking of glassware most frequently occurs because of very local overstresses (blows). The local character of applying load is equivalent to a sharp limitation of any equally loaded operating surface on the glass. Hardened glass, in contrast to glass with numerous surface defects, reacts to blows as if the possible appearance of the scale factor were restricted. Consequently, whatever the dimensions of a piece of sheet glass in glassware, it should manifest, when struck, greater strength than when the same stresses act on the entire surface. This is one of the advantages of hardened glass; here the scale factor has a positive value. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad (Physicotechnical Institute, AN SSSR)

SUBMITTED: 22Oct63 DATE ACQ: 27Apr64 ENCL: 00

SUB CODE: MT, SS NO REF SOV: 020 OTHER: 005

Card 2/2

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

S/0126/64/017/003/0435/0439

ACCESSION NR: AP4029003

AUTHOR: Vitman, F. F.; Ivanov, M. I.; Ioffe, B. S.

TITLE: Fracture of a rod during the impact of two short tensiles stress impulses

SOURCE: Fizika metallov i metallovedeniye, vol. 17, no. 3, 1964, 435-439

TOPIC TAGS: tensile stress, rod fracture, tensiometric measurement, friable state

ABSTRACT: The authors made an attempt to fracture a metal rod by simultaneously loading both ends by means of an explosion. By means of tensiometric measurements were explained the wave amplitude changes after the first collision, reflection from the ends of the second collision during which the structure of the tensile impulses cause the fracture of the rod. The paper proves that the methods used for loading the sample and recording of parameters of the waves along the rod make it possible to measure the strength of materials which approach a brittle state. The method used and the equipment are explained in detail. A tensiogram of the stress in a rod of U10A tempered steel is given. The amplitude measurements of the colliding waves are given in a table. In conclusion the authors claim that the examined method may be useful only in limited cases when the metal is very close to a brittle state. This method is therefore inapplicable to a wide range of plastic materials. Never-

Card 1/2

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

ACCESSION NR: AP4029003

theless, this method may be used for a comparative evaluation of the breaking resistance of tempered steels and to study the influence of a transition from a static to a rapidly occurring impulse load of the metal on this characteristic. The development of methods for measurement of break resistance in plastic materials with impulse loading should be continued for the purpose of limiting the influence of plastic deformation waves which accompany the propagation and decrease the amplitude of the running wave. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffee AN SSSR (Institute of Technical Physics, AN SSSR)

SUBMITTED: 20May63 DATE ACQ: 27Apr64 ENCL: 00

SUB CODE: ML NO REF SOV: 003 OTHER: 003

Card 2/2

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

ACCESSION NR: AP4020582 S/0057/64/034/003/0519/0522

AUTHOR: Belyakov, L.V.; Vitman, F.F.; Zlatin, N.A.

TITLE: On the impact of deformable bodies and its simulation. 3. On the correspondence of the instantaneous values of the parameters of the simulated and simulating processes

SOURCE: Zhurnal tekhnicheskoy fiziki; v.34, no.3, 1964, 519-522

TOPIC TAGS: impact, deformable body, deformable body impact, simulation, impact simulation, deformable body impact simulation, steel dural impact, copper aluminum impact

ABSTRACT: On the basis of dimensional analysis, two of the authors have previously proposed the following general expression for the depth, L_K, of the crater formed by the normal impact of a body of revolution moving parallel to its axis on the plane surface of a large target (F.F.Vitman and N.A.Zlatin, DAN SSSR,146,No.2,337, 1962; ZhTF,33,No.8,982,1963) and experimental evidence of its adequacy has been obtained (L.V.Belyakov, F.F.Vitman and N.A.Zlatin, Ibid.,33,No.8,990,1963).

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

ACC.NR: AP4020582

$$\frac{L_K}{l_0} \simeq \varphi_1\left(\frac{\rho_{01}v_0^2}{H_1},\ \frac{H_2}{H_1},\ \frac{\rho_{02}}{\rho_{01}},\ k_0,\ \frac{l_0}{d_0},\ \frac{\rho_{02}a_2}{\rho_{01}a_1}\right)$$

Here H is the "dynamic hardness" of the material, ρ is the density, and a is the velocity of sound. l and d are characteristic longitudinal and transverse dimensions of the projectile and k is a form factor describing the shape of the projectile head. v_0 designates the impact velocity. The subscripts 1 and 2 refer to the target and projectile materials respectively, and the subscript 0 indicates the values prior to impact. It was hypothesized that not only the final crater depth L_K, but also the values assumed during the course of the impact process by all the relevant parameters are functions of the dimensionless quantities appearing in this equation and of an appropriate reduced time. To test this hypothesis, impacts of soft steel cylinders with dural targets and copper cylinders with aluminum targets were observed by an x-ray technique similar to that employed by V.A.Tsukerman and M.A.Manakova (ZhTF,24,No.2,391,1957). The materials and the impact velocities were so chosen that the dimensionless parameters in the above equation had the same values in the two cases. It was found that the penetration depth, the projectile length, and the maximum projectile width all were the same functions of the reduced time t/T for the steel-dural collisions as for the copper-aluminum collisions. Here t is the

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

ACC. NR: AP4020582

Time since contact and T is the duration of the impact process. T was 68 microsec for the steel-dural impact and 100 microsec for the copper-aluminum impact. Twelve x-ray photographs of the impacts are reproduced. Orig.art.has: 4 formulas and 3 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut im.A.F.Ioffe AN SSSR, Leningrad (Physico-technical Institute, AN SSSR)

SUBMITTED: 09Feb63 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: PH NR REF SOV: 017 OTHER: 006

Card 3/3

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

ACCESSION NR: AP4042020 S/0020/64/157/001/0087/0090

AUTHORS: Boguslavskiy, I. A.; Vitman, F. F.; Pukhlik, O. N.

TITLE: Increase of quenching stresses in glass for additional strengthening

SOURCE: AN SSSR. Doklady*, v. 157, no. 1, 1964, 87-90

TOPIC TAGS: glass processing, glass annealing, heat treatment, strengthening, prestraining

ABSTRACT: A direct measurement was made of residual stresses in glasses with a wide range of thickness, quenched at different cooling rates, in order to compare the resultant data with the theory in the range of Biot numbers hitherto uninvestigated (Bi > 5). This research was set up as a check on the hitherto prevalent opinion that quenching stresses cannot contribute much to further strengthening of glass. Glass plates 160 mm square and 5--25 mm thick were

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

ACCESSION NR: AP4042020

quenched in two liquids having different cooling abilities. The fact that 25 mm plates quenched in liquid could lead to heretofore unattainable compression stresses on the order of 50 kg/mm^2 (double what can be accomplished with intense air quenching) indicates that the possibility of increasing quenching stresses have not yet been exhausted. The seeming discrepancy between the intense growth of compression stress and simultaneous strong attenuation of the tensile stresses is explained. Comparison of the experimental data with several theories of glass quenching shows that the theoretical calculations of V. L. Indenbom (Collection: Fizika tverdogo tela, 1, Izd. AN SSSR, 1959, page 236) are in better agreement with the test results than those of G. M. Bartenev (Mekhanicheskiye svoystva i teplovaya obrabotka stekla, 1960). The final conclusion is that one of the promising ways of strengthening thick glass still lies in the possibility of increasing the Biot number during their quenching and in the appropriate development of suitable quenching media. Orig. art. has: 3 figures.

Card 2/3

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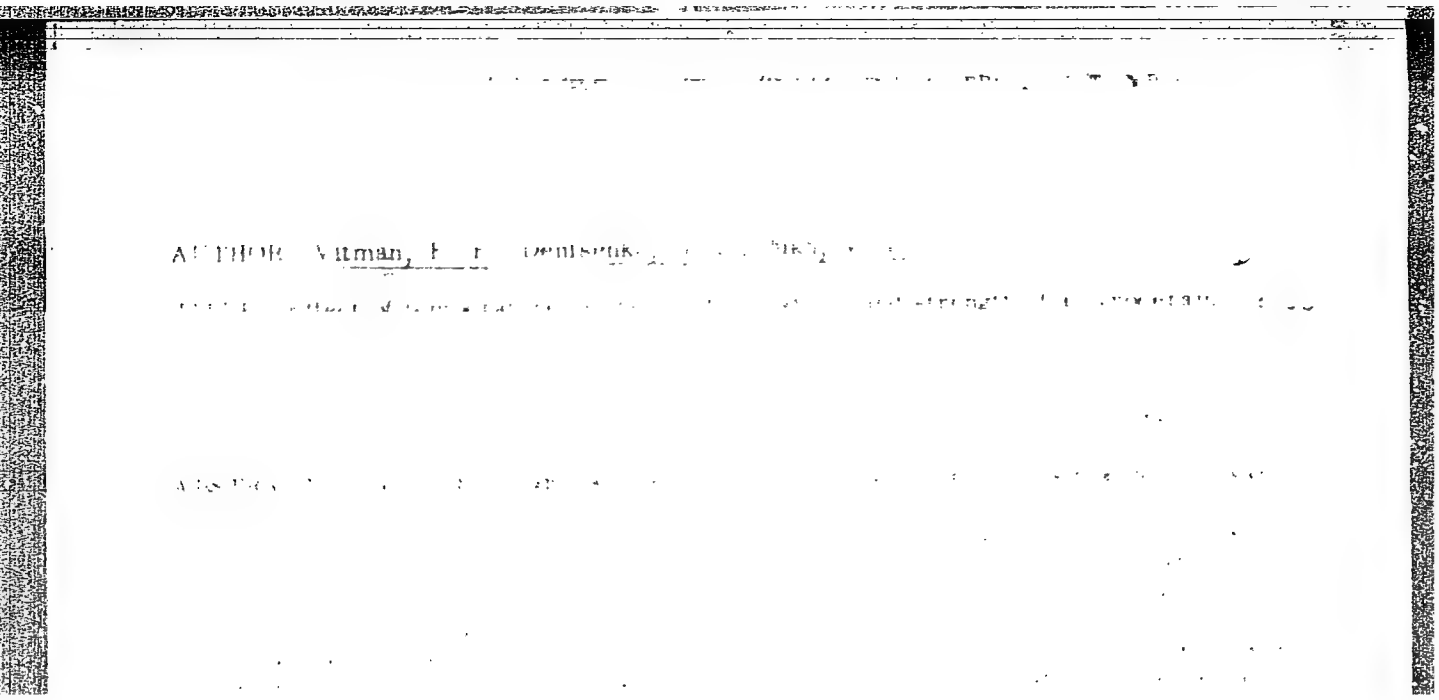

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changes with temperature in a steeper fashion than in the original glass, decreasing by a

Card 1/2

ACCESSION NR: AP5018932

Orig. art. has: 4 figures and 3 tables.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physi-

SUBMITTED: 11Feb65 ENCL: 00 SUB CODE:

NO REF SOV: 002 OTHER: 001

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

Card 2/2

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

L 41027-66 EWT(m)/EWP(e) WH/GD

ACC NR: AT6009599 (N) SOURCE CODE: UR/0000/65/000/000/0059/0070

AUTHOR: Vitman, F. F.

ORG: Physico-Technical Institute im. A. F. Ioffe, AN SSSR (Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR)

TITLE: Certain aspects of the strength of glass

SOURCE: AN UkrSSR. Fizicheskaya priroda khrupkogo razrusheniya metallov (Physical nature of brittle failure of metals). Kiev, Izd-vo Naukova dumka, 1965, 59-70

TOPIC TAGS: glass, glass property, tensile strength, bending strength

ABSTRACT: The technical tensile and bending strength of glass is known to be much lower than theoretical (e.g. for sheet glass the strength is ~10 kg/mm^2 whereas theory predicts a strength of ~1000 kg/mm^2). In this connection, the author presents certain results of a new investigation into the toughening of glass, carried out at the Physico-Technical Institute im. A. F. Ioffe, as based on the two-stage toughening method proposed by the author (Vitman, F. F., et al. V kn.: Nekotoryye problemy prochnosti tverdogo tela. M., Izd-vo AN SSSR, 1959, 340), which involves the combined tempering and etching of glass. Vertically drawn l. 5-, 3-,

Card 1/2

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

L 41027-66
ACC NR: AT6009599

5-, 8- and 12-mm thick specimens of glass (72% SiO_2, 8% CaO, 15% Na_2O, 3% MgO, 1.5% Al_2O_3, 0.5% SO_3) were divided into three groups: one group was subjected to tempering from 720°C in ethylpolysiloxane liquid heated to 120-140°C; another group, to etching in intensively stirred 20% HF; and the third group, to both tempering and etching. It was found that combined tempering and etching indeed produces the best results, enhancing the strength of thin-glass specimens to 100 kg/mm^2 and higher. These findings, incidentally, show that the old theories of the nature of the toughening of glass during tempering must be revised. The toughening effect in this case is not merely a result of an artificial relaxation of the tensile stresses in the glass; it is also associated with the rise of favorable physical changes in the rapidly cooled surface layers of glass. Orig. art. has: 8 figures.

SUB CODE: 11, 13, 20/ SUBM DATE: 27Aug64/ ORIG REF: 025/

Card 2/2 hs

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

ACC NR: AP6015470 (N) SOURCE CODE: UR/0181/66/008/005/1504/1510

AUTHOR: Vitman, F. F.; Masterova, M. V.; Pukh, V. P.

27
B

ORG: Physics Engineering Institute im. A. F. Ioffe, AN SSSR, Leningrad (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: The influence of temperature on the strength of etched quartz glass in a high-strength state

SOURCE: Fizika tverdogo tela, v. 8, no. 5, 1966, 1504-1510

TOPIC TAGS: quartz glass, glass property, temperature effect, glass product

ABSTRACT: It has been shown elsewhere that the strength of bulk sheet glass after etching in hydrofluoric acid solutions may be unusually high if the working surface of the glass is thoroughly protected from accumulations of defects before and during the experiment. The present investigation attempts to extend this finding to commercial bulk quartz glass and to study the influence of the temperature and the heat treatment on the strength of the quartz in its high-strength state (about 300 kg/mm^2). It is found that if the action of the irreversible heat processes which softens the glass and the influence of moisture in various manifestations are excluded, the strength of the quartz glass in the 50—400C temperature range is independent of

Card 1/2

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

L 46827-66
ACC NR: AP6015470

the temperature. Orig. art. has: 7 figures.

SUB CODE: 11/ SUBM DATE: 18Oct65/ ORIG REF: 015/ OTH REF: 009

Card 2/2 blg

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

L 9260-66 EWP(e)/EWT(m)/EWP(b) WH

ACC NR: AP5022711 SOURCE CODE: UR/0181/65/007/009/2717/2722

AUTHOR: Vitman, F. F.; Pugachev, G. S.; Pukh, V. P.

ORG: Physicotechnical Institute im. A. F. Ioffe AN SSSR, Leningrad (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: Safety factors and variation in the strength of plate glass

SOURCE: Fizika tverdogo tela, v. 7, no. 9, 1965, 2717-2722

TOPIC TAGS: sheet glass, high strength glass

ABSTRACT: It is shown that the values given in the literature for the strength of plate glass etched in hydrofluoric acid solutions are underestimated because insufficient attention is paid to possible accidental damage to the glass surface which may take place both before testing and while the glass is in the test installation. To verify this fact, special precautions are taken in testing the strength of glass after etching to see that damage to the surface is scrupulously avoided. A comparison with control experiments shows that the level of strength and dispersion in values observed in earlier experiments were due more to side factors than to the properties of the etched glass. The experimental data show that the guaranteed minimum values for the strength of the etched glass may be more than 100 $kg \cdot mm^{-2}$. When precautions are taken to avoid handling of the glass in any way after etching, ordinary window

Card 1/2

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

glass shows an average bending strength of ~250 $kg \cdot mm^{-2}$ with a much narrower spread in experimental values than previously observed. Measurements made in a dry vacuum to eliminate the effect of ambient humidity showed a more than double increase in strength. The experimental observations show that high strength is a property inherent in amorphous solids. It is suggested that the problem of producing high-strength glass may be solved not so much by developing methods for strengthening glass as by seeking ways to protect it from being weakened, since it is already in a super-strong state in its natural form. Orig. art. has: 1 figure, 1 table.

SUB CODE: 11/ SUBM DATE: 31Mar65/ ORIG REF: 022/ OTH REF: 003

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

[illegible], doktor f[illegible] [illegible] nauk; [illegible], G.S., kand. tekhn. nauk, V.I., kand. tekhn. nauk

[illegible] natural strength of sheet glass. Stek. i ker. 22 no.9:12-14 S '65. (MIRA 18:9)

1. Fiziko-tekhnicheskiy institut imeni Ioffe AN SSSR.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

L 5229-66 EWP(e)/EWT(m)/EWP(i)/EWP(b) WH

ACC NR: AP5026038 SOURCE CODE: UR/0072/65/000/009/0012

AUTHOR: Vitman, F. F. (Doctor of physico-mathematical sciences); Pugachev, G. S.; Pukh, V. P. (Candidate of technical sciences)

ORG: Physicotechnical Institute im. A. F. Ioffe, AN SSSR (Fizikc-tekhnicheskiy institut AN SSSR)

TITLE: Natural high strength of sheet glass

SOURCE: Steklo i keramika, no. 9, 1965, 12-14

TOPIC TAGS: sheet glass, glass property, hydrofluoric acid

ABSTRACT: Measurements of the strength of various parts of window glass before and after etching with hydrofluoric acid showed a great scatter of values (10—160 kg/mm^2 for etched glass). Measurements made after steps were taken to protect the etched surface from new flaws show that glassses reinforced by etching, i.e, freed from inherent and acquired surface defects, manifest their actual high-strength state if no accumulation of random damage is allowed to occur prior to and during the test. The observations lead to the important conclusion that the structural state of massive glass is in no way stronger than the state of glass fibers or drawn rods. Orig. art. has: 1 figure.

SUB CODE: MT / SUBM Date: 00 / ORIG REF: 011 / OTH REF: 001

Card 1/1 UDC: 666.11.01:620.172

0701/1364

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L 5310-66 EWP(e)/EWT(m)/EWP(i) WH

ACC NR: AP5025714 SOURCE CODE: UR/0286/65/000/018/0070/0070

AUTHORS: Boguslavskiy, I. A.; Vitman, F. F.; Pukh, V. P.

ORG: none

TITLE: A method for strengthening glass and glass products. Class 32, No. 174776

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 18, 1965, 70

TOPIC TAGS: glass, glass product

ABSTRACT: This Author Certificate presents a method for strengthening glass and glass products by quenching them from the temperatures near the temperature of softening with the help of cooling substances. To prevent strength-lowering structural and physical alterations in glass during its hardening, glass is quenched with substances of the greatest cooling capacity exactly in the anomalous range of glass hardening temperatures.

SUB CODE: MT/ SUBM DATE: 11Nov60/ ORIG REF: 000/ OTH REF: 000

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F.F.; IVANOV, M.I.; IOFFE, B.S.

Resistance to rupture of plastic metals under impulse loading. Fiz.met. i metalloved. 18 no.5:717-723 N '64.
(MIRA 18 4)

1. Fiziko-tekhnicheskiy institut im. A.F.Ioffe AN SSSR.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, F.F.; DENISENKO, G.I.; PUKH, V.P.

Effect of temperature on the modulus of elasticity and strength of pyroceram. Izv. AN SSSR. Neorg. mat. 1 no.6:952-956 Je '65. (MIRA 18:8)

1. Fiziko-tekhnicheskiy institut imeni A.F. Ioffe AN SSSR.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

L 1656-66 EWT(m)/EWP(e)/EWP(i)/EWP(b) WH

ACCESSION NR: AP5019427 UR/0020/65/163/003/0617/0620

AUTHOR: Baykova, L. G.; Vitman, F. F.; Pugachev, G. S.; Pukh, V. P.

TITLE: The high-strength state of glass

SOURCE: AN SSSR. Doklady, v. 163, no. 3, 1965, 617-620

TOPIC TAGS: glass property, high strength glass, hardening

ABSTRACT: The authors examine the reasons for the spread in individual strength values for glass hardened by various thermal and chemical methods. It is assumed that the high strength observed in certain specimens from a single batch of glass is not an accident, and that this high strength would show up in the majority of the glass specimens if it were not for strong suppressing side factors. These suppressing effects are attributed chiefly to atmospheric humidity and to possible damage of the glass during installation in the testing equipment. To test this hypothesis, experiments are conducted in which the glass is protected from harmful factors from the moment hardening is started. Strength measurements show that these precautions raised the minimum strength level noticeably in the scatter zone. However, it was found that weakening influences were not completely eliminated.

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ACCESSION NR: AP5019427

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Samples were then selected which were free from visible surface defects. This precaution further narrowed the scatter region and consequently increased the average strength of the batch of glass samples tested. Similar tests conducted with various types of glass hardened by various methods show analogous results. These experiments indicate that super-high-strength glass can be produced by finding practical ways to eliminate the weakening factors. It is recommended that further research should be done to determine just what these harmful factors are. Orig. art. has: 2 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences SSSR)

SUBMITTED: 27Nov64 ENCL: 00 SUB CODE: MT

NO REF SOV: 017 OTHER: 001

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

YEMELIN, V., inzh.; MARCHENKO, N.; PASTUKHOV, V., inzh.; MIRONOV, A., inzh.; VITMAN, K., inzh.; BOBORYKIN, Ye., inzh.

New developments in the building practice. Na stroi.Ros. 4 no.6:4, 6, 10, 19, 21 Je '63. (MIRA 16:6)
(Building--Technological innovations)

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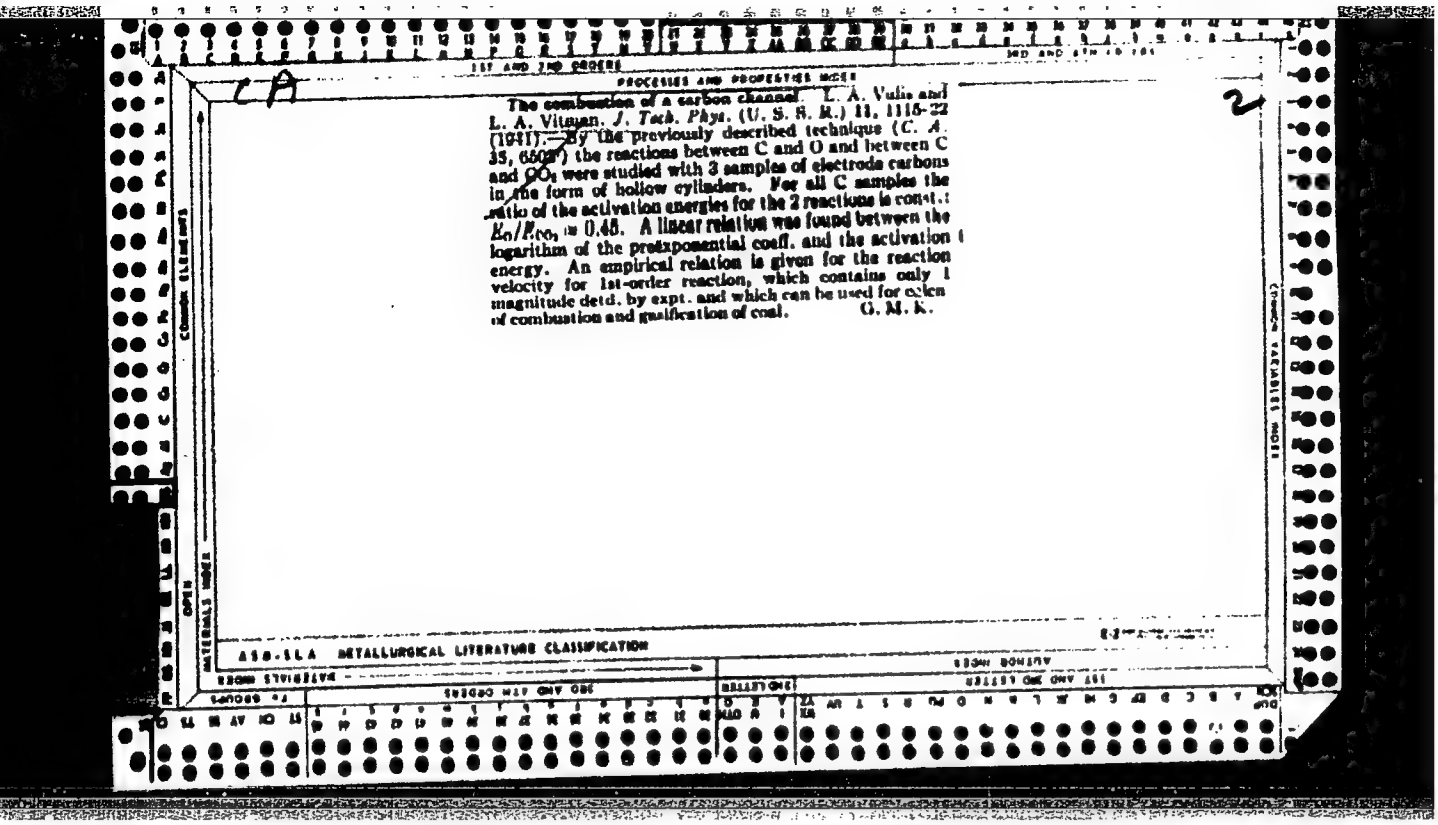

CA

2

The combustion of a carbon channel. L. A. Vulis and L. A. Vitman. *J. Tech. Phys.* (U. S. S. R.) 11, 1115-22 (1941).—By the previously described technique (*C. A.* 35, 6502⁹) the reactions between C and O and between C and CO_2 were studied with 3 samples of electrode carbons in the form of hollow cylinders. For all C samples the ratio of the activation energies for the 2 reactions is const.: $E_O/E_{CO_2} = 0.48$. A linear relation was found between the logarithm of the preexponential coeff. and the activation energy. An empirical relation is given for the reaction velocity for 1st-order reaction, which contains only 1 magnitude detd. by expt. and which can be used for calcn of combustion and gasification of coal. G. M. K.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

VITMAN, L.A.

p.3

PHASE I BOOK EXPLOITATION 1053

Voprosy aerodinamiki i teploperedachi v kotel'no-topochnykh protsessakh; sbornik statey (Aerodynamic and Heat Transfer Problems in Boiler and Furnace Processes; A Collection of Articles) Moscow, Gosenergoizdat, 1958. 329 p. 6,000 copies printed.

Ed. (title page): Knorre, G.F.; Ed. (inside book): Borishanskiy, V.M.; Tech. Ed.: Zabrodina, A.A.

PURPOSE: The book is intended for engineers and combustion specialists concerned with the design and operation of heating equipment and it is also for scientific workers and students of vtuzes.

COVERAGE: The book presents the results of complex investigations of flow conditions and heat transfer in boiler and furnace processes. The compilation consists of three parts which discuss the conditions of atomization and combustion of liquid fuel, some problems of heat transfer and flow in furnaces and boilers and, finally, the results of investigations of the flow and heat transfer in a

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layer of crushed material. The articles in the first part present the fundamental principles for calculating the atomization process in injectors. Also, new data on the combustion of droplets of heavy liquid fuel are given which make it necessary to reconsider the accepted concept that vaporization of a liquid fuel always precedes its combustion. The reports of the second part throw light on the problem of the motion of a dusty air stream characteristic of cyclonic furnaces. This problem is extremely important in the design of such furnaces. The second part of the collection presents data necessary for the calculation of the emission of fly ash whereby it is shown that this emission is of great significance. In addition, the character of furnace temperature fields is analyzed. The articles of the third part present the fundamental laws of gas flow through a layer of fuel and give the theoretical principles necessary for calculating the aerodynamic resistance of the layer and the speed of drying in it. The data given in the collection accurately define current ideas regarding the characteristics of development of a number of phenomena which form the

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heating process. Knowledge of these data will permit refining the calculation methods used in heating technology. The first part contains 2 Soviet references; the second part contains 8 Soviet, 3 English, and 1 German reference; and the third part contains 49 Soviet, 12 English, 7 German, 1 French, and 2 Japanese references.

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S/112/59/000/016/006/055
A052/A002

11.7410

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1959, No. 16, p. 21, # 33517

AUTHORS: Vitman, L.A., Katsnel'son, B.D., Efros, M.M.

TITLE: Spraying Liquid Fuel With Pneumatic Nozzles

PERIODICAL: V sb.: Vopr. aerodinamiki i teploperedachi v kotel'notopochn. protsessakh. Moscow-Leningrad, Gosenergoizdat, 1958, pp. 5-34

TEXT: A criterion dependence for determining the average diameter of drops of a sprayed jet was obtained, based on application of the theory of similitude to the problems of spraying viscous liquid in pneumatic sprayers. To study the effect of viscosity on the degree of fuel dispersion special experiments were carried out on a laboratory apparatus on which the following liquids were investigated: 5 different solutions of glycerin, with water, kerosene and benzine, for which the viscosity was changed from 1 to 60 Engler degrees and the surface tension coefficient from $2.4 \cdot 10^{-3}$ to $7.2 \cdot 10^{-3}$ kg/m. Formulas for dependences obtained in the above experiments were derived. With these formulas it was not possible to establish the changes of the drop diameter along the jet.

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Spraying Liquid Fuel With Pneumatic Nozzles

On a special stand, five principal industrial-type sprayers were investigated: СТС - ФДБ-1 (STS-FDB-1), СТС - ФОБ-2 (STS-FOB-2), СТС - ФДМ-1 (STS-FDM-1), Glushakov's and a 2-stage nozzle. The experiments with all nozzles were carried out at their rated efficiency. On the basis of these experiments a recommendation concerning operational characteristics was worked out and an evaluation of the quality of sprayers was made. Some changes of the design of the tested sprayers were suggested. A formula for determining the degree of uniformity of drops (distribution by dimensions) was given.

S.M.Sh.

Translator's note: This is the full translation of the original Russian abstract.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

Vitman, L.A.

KUTATELADZE, Samson Semenovich; STYRIKOVICH, Mikhail Adol'fovich; VITMAN, L.A., red.; ZABRODINA, A.A., tekhn. red.

[Hydraulics of gas-liquid systems] Gidravlika gazo-zhidkostnykh sistem. Moskva, Gos. energ. izd-vo, 1958. 232 p. (MIRA 11:7)
(Systems (Chemistry))

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860120014-8

ACC NR: AT7007327 SOURCE CODE: UR/3196/65/000/059/0114/0115

AUTHOR: Vitman, L. A.

ORG: none

TITLE: Regularities in the pulverization of a fluid by atomizers and the motion of drops in a gas flow

SOURCE: Leningrad. Tsentral'nyy nauchno-issledovatel'skiy i proyektno-konstruktorskiy kotloturbinnyy institut. Trudy, no. 59, 1965. Gidravlika gazozhidkostnykh smesey i potokov pri sverkhkriticheskom davlenii (Hydraulics of gas-liquid mixtures and flows under supercritical pressure), 114-115

TOPIC TAGS: gas flow, fluid flow, atomization, droplet atomization

ABSTRACT: The flow granulation theory's main inferences have been proved experimentally, and the constants characterizing the pulverization systems used in industry and agriculture have been determined. Functions are given for determining the efficiency of an atomizer, its discharge coefficient, and the average diameter of drops, by which the degree of flow dispersion and the distribution of drops by size are characterized. A formula applicable to all types of atomizers is given for drop dis-

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tribution by size, and functions are presented for the distribution of a fluid across the flow section of pressure-jet, air-blast, and pressurized atomizers. In cases where gravity is taken into consideration, the effect of the Reynolds number must be taken into account. Orig. art. has: 2 formulas. [GE]

SUB CODE: 13,20/ SUBM DATE: none/ ORIG REF: 009/ ATD PRESS: 5117

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PHASE I BOOK EXPLOITATION SOV/6121

Vitman, Lyudmila Aleksandrovna, Boris Davidovich Katsnel'son, and Il'ya Isaakovich Paleyev

Raspylivaniye zhidkosti forsunkami (Spray Atomization of Liquids). Moscow, Gosenergoizdat, 1962. 263 p. Errata slip inserted. 6000 copies printed.

Ed. (Title page): S. S. Kutateladze; Tech. Ed.: Ye. M. Soboleva.

PURPOSE: This book is intended for technical personnel and senior students in schools of higher technical education engaged in the design and construction of power and spray installations.

COVERAGE: Regularities of liquid-jet disintegration and a generalization of experimental data on atomization of liquids are presented. Descriptions and basic characteristics of various types of atomizers are given and some examples of atomizer design are presented. Combustion of a single droplet and of a liquid-fuel spray is studied. There are 147 references: 109 Soviet, 37 English, and 1 French.

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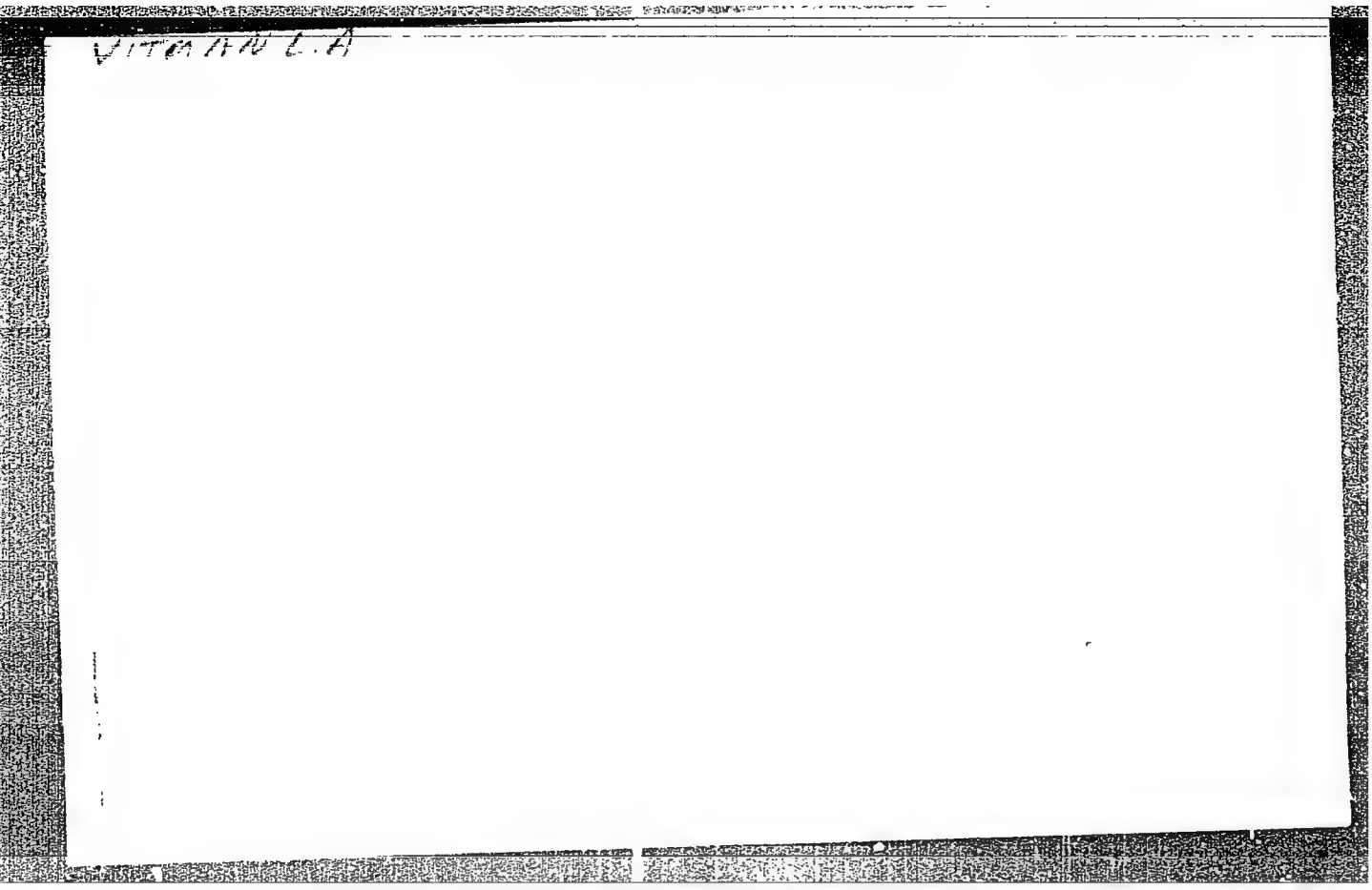

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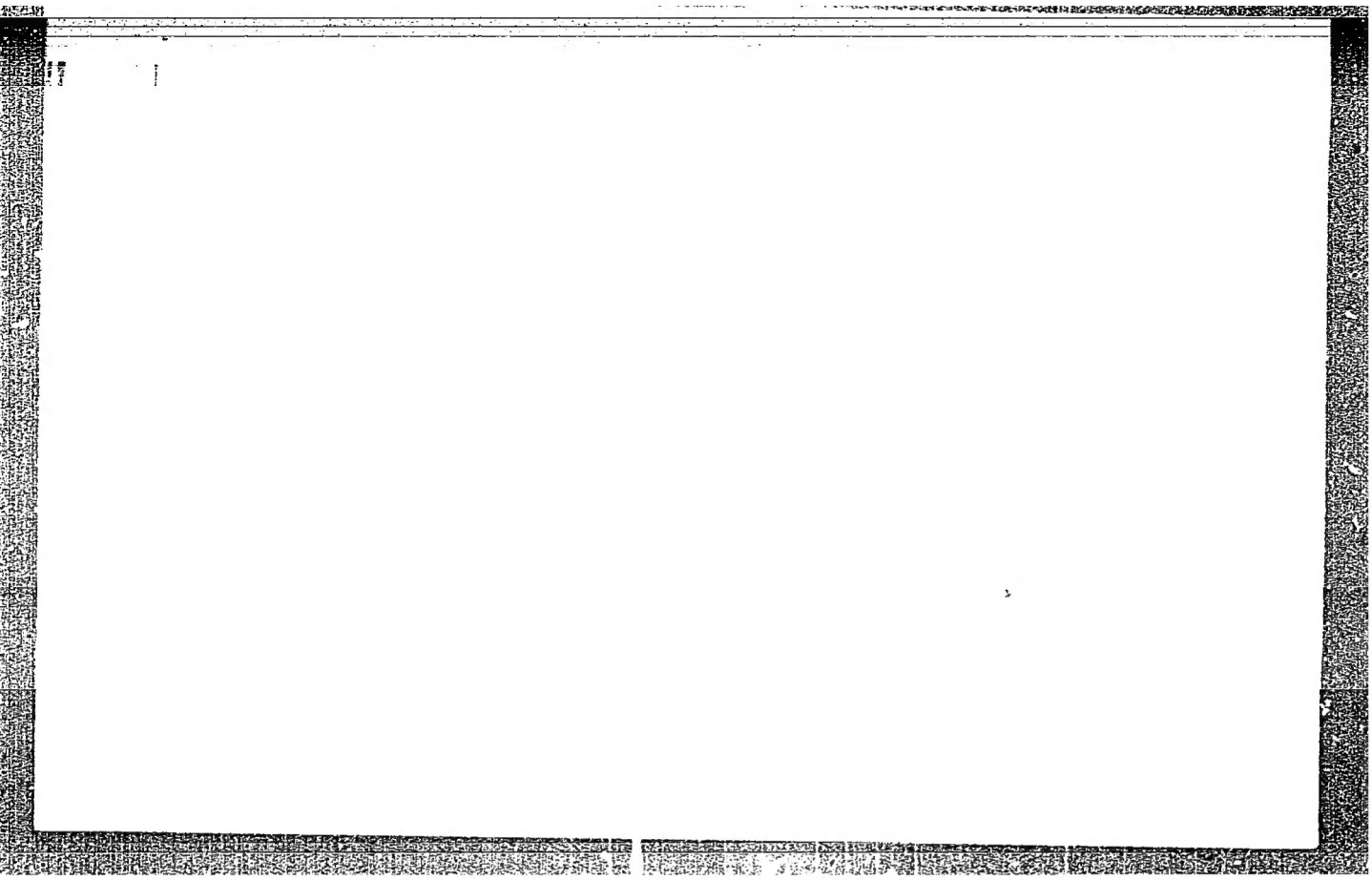

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S/0169/64/000/002/G027/G027

ACCESSION NR: AR4033593

SOURCE: Ref. zh. Geofiz., Abs. 20191

AUTHOR: Ostrovskiy, A. Ye.; Pikha, Ya.; Skal'skiy, L.; Mironova, L. I.; Vitman, N. G.

TITLE: Tidal tilts indicated by observations with photoelectric tiltmeters at Przhibram (near Prague)

CITED SOURCE: Sb. Izuch. zemn. prilivov. No. 3. M., AN SSSR, 1963, 59-69

TOPIC TAGS: gravity field, tiltmeter, photoelectric tiltmeter, earth tide, tidal tilt, earth tide component

TRANSLATION: Photoelectric tiltmeters of the Institute of Physics of the Earth of the Academy of Sciences USSR were set up at Przhibram in 1960 at a depth of 1,300 m near the horizontal pendulums of the Czechoslovakian Academy of Sciences. The electrodynamic constants of the tiltmeters were determined to an accuracy of 0.1-0.3%. The record of the tidal tilts was continuous with small gaps from June to December 1960. The behavior of individual components differed sharply from one another. Over a 7-month period the tilt in the north-south direction was 3" and in

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the east-west direction 30". This tilt was caused by the movement of two blocks along whose contact a mine working had been excavated. The rate of the tilting did not remain constant with time, which appreciably worsened the results of analysis of the tidal observations. Harmonic analysis gave the following mean values γ determined from the M_2 wave:

$$\gamma_{N-S} = 0.665 \pm 0.011 \qquad \gamma_{E-W} = 0.702 \pm 0.019.$$

These figures indicate the existence of a real difference between γ_{N-S} and γ_{E-W} at Prshibram. B. Pertsev

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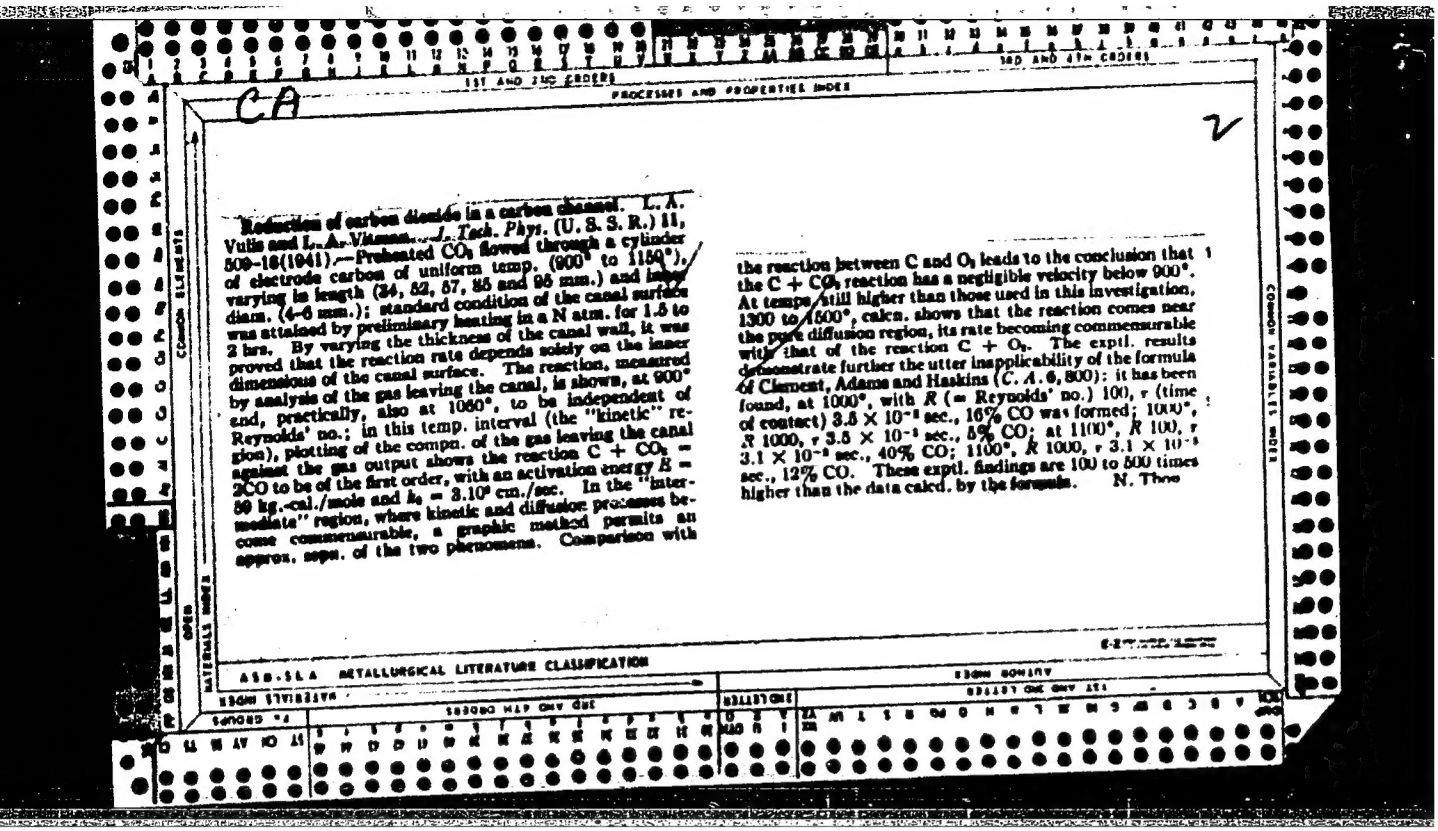

CA

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Reduction of carbon dioxide in a carbon channel. L. A. Vutis and L. A. Vitman. *J. Tech. Phys.* (U. S. S. R.) 11, 509–18(1941).—Preheated CO_2 flowed through a cylinder of electrode carbon of uniform temp. (900° to 1150°), varying in length (34, 52, 57, 85 and 95 mm.) and in diam. (4–6 mm.); standard condition of the canal surface was attained by preliminary heating in a N atm. for 1.5 to 2 hrs. By varying the thickness of the canal wall, it was proved that the reaction rate depends solely on the inner dimensions of the canal surface. The reaction, measured by analysis of the gas leaving the canal, is shown, at 900° and, practically, also at 1060°, to be independent of Reynolds' no.; in this temp. interval (the "kinetic" region), plotting of the compn. of the gas leaving the canal against the gas output shows the reaction $C + CO_2 = 2CO$ to be of the first order, with an activation energy E = 59 kg.-cal./mole and k_0 = 3.10^5 cm./sec. In the "intermediate" region, where kinetic and diffusion processes become commensurable, a graphic method permits an approx. sepn. of the two phenomena. Comparison with the reaction between C and O_2 leads to the conclusion that the $C + CO_2$ reaction has a negligible velocity below 900°. At temps. still higher than those used in this investigation, 1300 to 1500°, calcn. shows that the reaction comes near the pure diffusion region, its rate becoming commensurable with that of the reaction $C + O_2$. The exptl. results demonstrate further the utter inapplicability of the formula of Clement, Adams and Haskins (*C. A.* **6**, 800): it has been found, at 1000°, with R (= Reynolds' no.) 100, τ (time of contact) 3.5×10^{-3} sec., 16% CO was formed; 1000°, R 1000, τ 3.5×10^{-3} sec., 5% CO; at 1100°, R 100, τ 3.1×10^{-3} sec., 40% CO; 1100°, R 1000, τ 3.1×10^{-3} sec., 12% CO. These exptl. findings are 100 to 500 times higher than the data calcd. by the formula. N. Thon

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